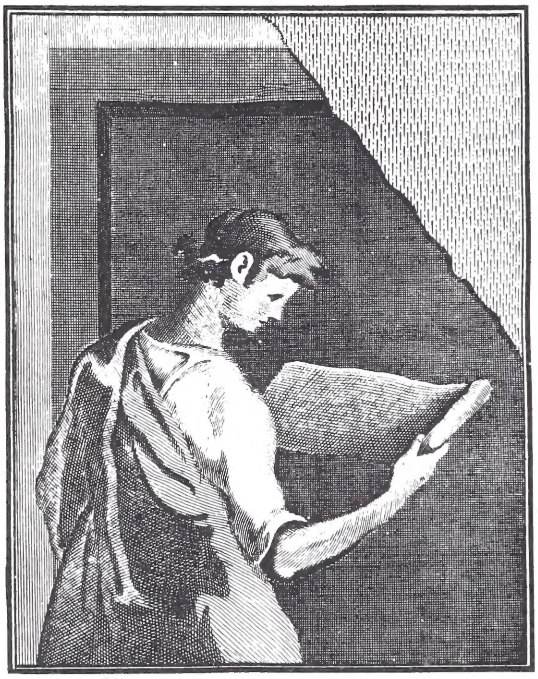

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THE BRITISH

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JOURNAL OF PHOTOGRAPHY,

PUBLISHED WEEKLY.

VOL. XXIV.

LONDON:
HENRY GREENWOOD, 2, YORK STREET, COVENT GARDEN, W.C.
PARIS: W. R. HARRISON, 11, Petite Rue des Couronnes, Asnières (Seine).
NEW YORK: E. & H. T. ANTHONY & CO., 591, Broadway. PHILADELPHIA: T. H. McCOLLIN, 624, Arch Street
MELBOURNE: J. W. SMALL & CO. ADELAIDE: B. GOODE & CO.

MDCCCLXXVII.

LONDON:
HENRY GREENWOOD, PRINTER, 2, YORK STREET, COVENT GARDEN, W.C.

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 870. Vol. XXIV.—JANUARY 5, 1877.

THE MOIST PRESERVATIVE.

We are much pleased to see that there is a fair prospect of the moist collodion process receiving a trial during the present year. Since Mr. Mawdsley introduced the subject of a moist preservative, or organifier, to the Photographic Society of Great Britain we have received several inquiries with respect to the likelihood of its superseding either the wet or dry process, or as to what extent it may prove useful.

We may here correct an error into which some appear to have fallen, namely, that the moist preservative is inseparably allied with emulsion plates. When Mr. Sutton, four years ago, first introduced and advocated the use of the moist organifier to washed films, he did so in connection with plates that had been prepared in a bath. Writing at that time upon this subject he said:—"If we use common dry-plate bromo-iodised collodion, and excite the films in a thirty-five-grain bath, and wash off all the free nitrate, we then pour over the films a deliquescent preservative and stow the plates in a suitable plate-box, they may be exposed in their damp state, returned to the box, and developed a day or two afterwards without ever having become dry at all, at the same time that their sensitiveness is certainly not impaired by remaining in the damp state." At the time Mr. Sutton wrote this we had been occasionally in the habit of using what has been termed the "glycerine process;" that is, a process in which a mixture of glycerine and solution of nitrate of silver was applied to a plate just after being removed from the silver bath, or without being washed. We, however, tried the formula prescribed by Mr. Sutton, and found that plates treated by it might be kept for a much longer period than if prepared by the original glycerine process, this latter being well recognised by all who have tried it as a process in which plates prepared by its agency could not be relied upon for more than four or five hours after preparation, even if so long.

But the full advantages of the process were only fully secured when a purely-bromised collodion was employed, instead of a bromo-iodised sample. Then, indeed, it was found to give a degree of sensitiveness that was not attainable with any other process. On referring to our note-book of the period we find that a bromised collodion containing eight grains of bromide of cadmium, which had been prepared by the *rapid* tannin process of Major Russell, was made use of by us in the preparation of some moist plates, the exciting bath containing seventy grains of nitrate of silver to the ounce. When the plates were removed from the bath they were thoroughly washed and coated with two drachms of glycerine, four drachms of water, and two drachms of a rather thin mucilage of gum arabic rendered slightly alkaline with ammonia. The exposure given to the plates, prepared in this manner, was much less than that required for plates prepared by the usual wet collodion process with iron development. The developer employed in our experiments was alkaline pyro. When gum is to be employed in any moist process care must be taken that the plates are used as soon after preparation as possible, for it is well known that a solution of gum arabic will rapidly become acid.

Mr. Sutton at first suggested albumen as the organifier; but, in view of its retarding properties, he subsequently recommended gelatine. The kind of gelatine to be employed must be a neutral sample. What he preferred was Nelson's neutral gelatine three grains, carbonate of soda one grain, water one ounce. If the plate was not to be used immediately, but kept for some time, one-half the water present was to be replaced by glycerine. This substance, when pure, is chemically inert.

The suggestion of making use of a tent on the field so as to develope the plate before leaving the spot must also be credited to Mr. Sutton. The formula which he preferred for slow moist plates was—albumen one part, water one part, and glycerine two parts, the collodion being of the bromo-iodised kind. When we made a trial of this modification, we developed the plates by first pouring water over the surface, then applying a four-grain solution of pyrogallic acid, by which a feeble image was brought to view; we then, after a slight rinse, applied a three-grain solution of pyro., containing two grains of citric acid and a few drops of nitrate of silver solution. This brought out the details of the image with great vigour, and we have now in our possession several negatives taken both by Mr. Sutton and ourselves which will bear favourable comparison with those by any other process whatever.

To Mr. Mawdsley is due the credit of successfully applying this moist preservative to plates prepared by the emulsion process, and of having brought it prominently forward before the Photographic Society of Great Britain. From our latest experiments we find that it can be applied to plates coated with the popular emulsion of the day without any necessity for washing them afterwards. In preparing them with this material we have placed the preservative in a bath, and allowed the plates to be immersed for a few minutes. These experiments are still being continued.

CLOUDS IN LANDSCAPE NEGATIVES.

At the commencement of a new year it will not be out of place to review the results of the past season, noting in what respects we have fallen short of our expectations, and endeavouring in the future to remedy the defects of the past. But, however appropriate to the occasion such a course may be, we fear to carry it out in its entirety would require considerably more space than we can afford to it; still in the matter of landscape work we wish to make a few remarks upon a much-neglected aspect of the question.

In looking over a portfolio of landscapes, by even our best amateurs, how comparatively few of the pictures strike the eye as being worthy of any special notice! If examined critically they may, perhaps, be found technically perfect, the subject well chosen, and the picture full of softness combined with vigour. They are, in fact, the type of too many of the productions not only of amateurs but also of professionals, and while perfect *as photographs* possess no features to render them noticeable *as pictures*. There is in the system of many photographers only too much ground for the reproach that photography is a mechanical operation, and in no branch of the art (as we choose to consider it) is this more true than in landscape work. The operator too frequently proceeds entirely by rule of thumb. He plants his camera before a subject merely because it is well known, or is considered picturesque, the latter being a point upon which, possibly, he is incompetent to form an opinion; and, knowing that his plate will require a certain exposure for that class of subject, he gives that exposure in much the same manner as he would boil a leg of mutton of a certain weight for the regulation time; the development is performed in the same mechanical manner, experience having taught him that, as a rule, a certain fixed formula gives the best result, and should the picture prove unsatisfactory, the fault is set down to perhaps anything but the right cause. Thus it comes about that we are flooded with such numbers of landscapes, beautiful, perhaps, in their faultless manipulation, but as devoid of spirit despite their beauty as the wax figures in a hair-dresser's window. The artist (?) is to blame; for having mastered the use of his tools, he considers his end attained, forgetting that he has only surmounted the first step necessary to the accomplishment of his object.

This state of things should not be, and in the department of portraiture it has long ceased to exist; for, thanks to the improved taste of the public and the persevering efforts of their caterers, something more than a mere soulless delineation of the "human form divine" is required of the portraitist. There is no reason, that we can see, why the same should not be the case in landscape photography; but, while we recognise the fact that there are notable exceptions to the rule amongst both professionals and amateurs, the majority of the latter, having only themselves to please, are content with results which, had they to pass the ordeal of public judgment, would be tried in the balance and found wanting. The healthy stimulus given to artistic photography by the institution of exhibitions and prizes is unfortunately not so great as it might be; for, owing to the apathy of the general body of amateurs, the number of those who avail themselves of the opportunities offered is very limited.

In suggesting the exercise of greater taste in landscape work it is not our province, nor do we intend, to launch out into a dissertation upon matters artistic. True artists, like poets, are "born, not made;" and any attempt, within the limited bounds of this article, to drive æsthetic notions into minds even well prepared to receive the seed savours too much of the profitless occupation of scrubbing a negro to remove his colour. However, without trenching upon the ground of the art teacher, we may point out to our readers one direction in which they may, by the exercise of a moderate amount of judgment, add greatly to the character of their productions, and that without entailing any material increase of trouble, namely, by the introduction of clouds and effects of distance.

It is at first, perhaps, surprising, considering the capabilities of photography, that so little attention is devoted to the greatest charm of a landscape—the sky; for though the very nature of the principle involved is directly against the simultaneous production of clouds with the less brilliantly illuminated terrestial objects, there are numerous simple expedients which render the operation not only possible, but easy in the extreme. It may be that the rare recurrence of striking examples of cloud effects, and the rapidly changing character of the masses of vapour in our climate, have had a deterrent effect upon photographers who do not care to provide themselves with fittings which may, perhaps, be required but once in a season; but, on the other hand, they should bear in mind that the same appliances which are used for cloud effects serve also for rendering ærial perspective in the distance and for subduing the too obtrusive light in a picture—two functions which will be found by no means sinecures.

A very common method of "burking" the difficulty—for such it really is—consists in printing-in the clouds from a separate negative; but, in order to obtain a satisfactory and truthful result, artistic training and also a knowledge of the phenomena of nature are absolutely necessary, as well as a pretty extensive stock of cloud negatives suited to different subjects and lights. The practice of "painting in" clouds artificially require, to a greater extent, artistic skill, as well as the necessary manipulative power; and unless performed by an artist is worse than useless. The methods best adapted to the requirements and capabilities of the amateur are based upon the use of a screen or shade, by which the sky and distance of the picture are protected from the light's action during a portion of the exposure. The principle is simple enough, but some little care is necessary in carrying out the details of the arrangement in order to ensure complete success; but, the mechanical arrangements being perfect, a little practice will perform the rest.

The screens referred to may be employed either in or outside the camera; the latter form, being the easiest of application, is the one more generally used. The simple form of sky-shade adapted to some of the modern landscape lenses is the type of this class, and is capable of rendering very charming effects, especially in subduing distances or harmonising foregrounds. For cloud purposes, however, its sphere is limited by the nature of the sky-line; for it is obvious that the straight edge of the sky-shade will not adapt itself to an irregular outline, such as a tree, or group of trees, standing out against the sky. The Rev. Canon Beechey, some time ago, described an improvement upon this form, consisting of a hinged shade divided into three sections capable of being set at different angles. This "split sunshade," as it was called, has been more recently further improved by increasing the number of divisions, so as to render it more easily adaptable to an irregular sky-line; and it has, we believe, been found to answer its purpose remarkably well.

Some have preferred, however, to fit the shade *inside* the camera and work it from the outside by means of a milled head projecting through the wood work. Though a little more troublesome in fitting, the difficulties are not of a serious nature, and the results as regards facility of application and softness of the line of division between earth and sky are said to be superior to the outside shade. None of these forms, however, are well adapted for us when the sky-line is very irregular, or when isolated objects project a considerable distance into the sky space. With a background composed of a ridge of undulating hills or a tolerably even line of foliage, they answer perfectly; for it is not necessary to follow every indentation in the horizon closely. By giving a slight motion to the shutter, so as to vignette, as it were, the sky into the rest of the picture, no inconvenience occurs.

But if the subject include a church spire outlined against the sky, or a row of isolated trees with the sky showing between them in large masses, the above course is inapplicable, and we must resort to the use of a mask cut roughly to the shape of the sky-line. This, perhaps, appears a rather formidable operation to perform; but by the method we are about to describe it becomes a mere mechanical operation, and is performed with the greatest ease. There is no difficulty in making the necessary alteration in any camera already existing, or, at least, no insuperable difficulty. The screen should be placed as close as possible to the surface of the plate, and must, of course, work from the lower portion of the camera, to which it is fitted in the following manner:—

A hole is made through the outer body of the camera in such a position that it shall enter the edge of the inner frame to which the bellows are attached. It is continued so that a thin rod of brass may be passed through the interior of the camera from side to side and lie on a line with, and close to, the bottom edge of the shutter of the dark slide, and parallel with the bottom and front of the camera. A portion of the inner frame may require to be cut away, in order to prevent the rod coming across a portion of the plate, but this will rarely be the case. The rod should not be passed entirely through the camera, but just so far as to enter the opposite edge of the inner frame. A milled head is fitted on the end which projects outside the camera, and a small pointer to indicate the position of the shutter will be found advantageous. The rod having been passed into position a piece of thin sheet brass the length of the plate is bent round it, and the edges brought together so as to form a clip in which a sheet of paper may be held, the brass being well blackened to prevent reflection.

The method of using this screen is as follows:—The picture having been focussed, a strip of paper (a stock of which should be kept ready for the purpose) is placed upon the lower edge of the frame of the focussing-screen, and with a lead pencil a rough outline of the sky-line traced upon it—an operation performed with the greatest ease under the focussing-cloth. It is not necessary to be very exact—in fact the line should be drawn so as overlap the picture about the eighth of an inch. Cut along the pencil line with the point of a penknife, and a screen is produced which fits the most intricate sky-line it is possible to meet with; this is slipped into the brass clip in the interior of the camera, and may be placed in any required position by means of the milled head attached. All that is necessary is to note by means of the pointer the position of the sky-line, and to keep the mask in gentle motion about that point until the landscape shall be judged to have received its proper exposure, when the sky may receive its quota of time by simply turning down the milled head. White paper should not be used for the mask on account of the light reflected from it inside the camera, and blackened or dark-coloured paper would not transmit the image to permit tracing the sky-line. This difficulty may be obviated by tracing the image on a piece of thin white paper, which is afterwards laid upon a piece of dark colour, and the outline cut upon that.

Such is the principle of what will be found a very useful adjunct to the landscape camera; but our readers may, of course, improve upon it in any manner which may suit their individual fancies.

EDINBURGH PHOTOGRAPHIC SOCIETY'S EXHIBITION.

[Second Notice.]

In resuming our critical notices of this Exhibition we may here correct a slight error which crept into our previous article, in which the galleries were said to be nearly a hundred feet in length. It should have been considerably over two hundred feet.

All the fourteen classes of subjects for which medals were offered are well represented, and the judges will find it no easy matter to select the best picture, "irrespective of size and subject," for which the gold medal is to be given.

Of landscapes of 8½ × 6½ and under there is a large display. Mr. Parker, Glasgow, in Nos. 440 and 445, shows four charming little views, *Kilburn Glen* and *Crosbie Castle;* and his *Polmadie House* (No. 75) is also excellent.

In Nos. 76, 111, and 122 we have from Mr. Robert Murray, C. E., a number of soft, brilliant little pictures, those of *Arthur's Seat* and *Salisbury Crags* being especially so.

Mr. Frank Beasley, Jun., exhibits a number of pretty "bits." *In Miller's Dale* (No. 357) little is left to be desired.

Mr. G. W. Wilson, of Aberdeen, has several frames of his well-known views, every one of which demands careful study by all who aim at doing the very highest class of work. The cloud effects in No. 307 are as nearly perfect as possible. Mr. Valentine, of Dundee, shows in Nos. 288 and 289 a similar set of views, of very fine quality. Mr. Pettitt, of Keswick, has sent a number of good views of *English Lake Scenery* (Nos. 279 and 282); and Mr. P. Mawdsley, of London (No. 280) some beautiful pictures from emulsion negatives.

Mr. Geo. A. Panton, Edinburgh, in No. 576 does full justice to some charming local scenery, and Mr. James Crighton also exhibits several beautiful local views; while No. 579, and a frame (No. 867), by Mr. Hugh Pillans, in the same style, will repay attention.

Mr. Wm. England has sent a series of very exquisite pictures from dry plates, consisting of views in Switzerland, Belgium, &c.

Mr. Henry Cooper shows some very small pictures, among which *A Devonshire Cottage*, with a little girl at the well (No. 1005), is a delightful *morceau*.

The class of landscapes above 8½ × 6½ is also thoroughly well represented. Mr. Vernon Heath, as usual, comes to the front with a number of fine 12 × 10 pictures, artistically selected and well manipulated. They consist principally of Scottish scenery, and are very characteristic. *Rocks and Burn, Glen Sligachan* (No. 327), *Scour na Gillean* (No. 985), *Waterfall, Dunvegan* (No. 329), and *Falls of Linighluten* (No. 330), may be taken as examples.

Mr. Thomas Annan, Glasgow, in *White Cattle, Cadzow Forest* (No. 325), gives a wonderfully-beautiful picture of a difficult subject; and *Autumn Morning* (No. 315) and *Summer Evening* (No. 326) show that it is possible to secure magnificent cloud effects combined with sufficient detail in the terrestrial portions of the picture at one operation.

Mr. A. Williamson (No. 4) exhibits twenty-four views of highland scenery—all good, and a few of them of very high quality. His *View on the Ungue, Kilillan Fall,* and *Gilmoal Burn,* are examples of first-class work.

Mr. Payne Jennings, of Dublin, shows a case of nine exquisite landscapes (No. 233), which always attract an admiring crowd. Unquestionably part of their beauty arises from the fact that they are cemented to the glass; but there can be little doubt that the general opinion is pretty nearly correct—that is, that they are perfect gems, both artistically and technically.

Mr. R. Crawshay is a large exhibitor, but his pictures have been already noticed in connection with the recent exhibition in London, and therefore we need not dwell on them.

Mr. Nicholson, of the Isle of Wight, sends several admirable pictures. *Bonchurch Valley* (No. 27) is very fine, though rather darkly toned.

Mr. George Wardley's *Moat, Chorley Old Hall* (No. 25) and *On the River Llugwy* (No. 48) are both excellent specimens, and so is *A View of Aberglaslyn* (No. 152).

India is well represented by Mr. G. L. Kemp—the Secretary of the Bengal Photographic Association—and Mr. R. Philips, who have each sent a number of very beautiful pictures of Indian scenery. The latter also exhibits a series of pictures illustrating the process of tea manufacture in the Himalayas.

Mr. B. Wyles, of Southport, has sent several choice large pictures—especially *Below Pont-y-Pan, Bettws-y-Coed* (No. 99); but they would meet with more general favour if slightly warmer in tone.

Mr. J. M. Turnbull's *White Horse Close* (No. 79) and Mr. Matheson's *Guardhouse at Holyrood* (No. 146) are both fine specimens of architectural work.

Mr. Alexander Henderson, of Montreal, exhibits eight admirable subjects, principally ice scenes on the St. Lawrence and Niagara, (No. 600). *Ice Cone*, 170 feet high, at Montmorenci Fall, is an interesting and beautiful picture.

Mr. Fox, of Brighton, in Nos. 650, 651, and 652, shows three excellent pieces—soft, but brilliant; but his picture numbered 674 is somewhat lacking in contrast.

Mr. W. D. Sanderson, of Manchester, is in strong force. His series of large pictures from collodio-albumen negatives are especially good. *The Cottage*, at Aberglaslyn (No. 300), and *Vale of Festiniog* (No. 276) are perhaps the most general favourites.

Mr. Bedford shows numerous examples of his always excellent work, his *Tintern Abbey* (No. 1118) being exceptionally fine. So also is a more distant view of the same abbey (No. 313), but we think all would look better if warmer in tone.

The remainder of the classes shall be taken in their order in future articles.

The investigations of Dr. Schnauss recorded in another column are suggestive of an economy which may eventually be universally practised, though in the present status of the carbon process it appears not to have been considered worthy of adoption. The benefits to be derived from it are, however, not so obvious as in the case where the residues consist of gold and silver, as a difficulty will be experienced in finding a market for the material saved; the manufacturers of carbon tissue on a large scale would in all probability find it to their advantage to employ new materials, or at best would be inclined to give a price unremunerative when the care and trouble of collecting the residue is taken into account. To those who prepare their own tissue, if there be any such, the advantage would be more distinct, as they might, of course, re-utilise the products of their economy. With regard to the saving of chromic acid, it is extremely doubtful whether the gain pecuniarily would be commensurate with the time and trouble expended; for, though Dr. Schnauss himself may prefer to employ the more expensive bichromate of ammonia, such is not the usual practice, nor is it either necessary or advantageous. The potassic salt, which is considerably cheaper, answers every purpose, and with the addition of a small quantity of ammonia, as recommended by Mr. J. A. Spencer, is at least equal, if not superior, to the other. It would not, we imagine, be found worth while to recover the chromic acid when the potassic salt is used, though, of course, anything saved is a gain if the operation be not accompanied by an undue amount of trouble. The colouring matter seems likely to form a more important item in the question, if it can be recovered in a state equal in quality to the original material. It forms a rather serious item in the cost of the preparation of the tissue, as the finest quality of pigment is necessary for the production of the best results. Its collection presents no difficulty, as the developing water requires simply to be set on one side in a vessel kept for the purpose, when the colouring matter will subside without further attention, and in a state of the finest possible division.

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ON SOME RECENT ATMOSPHERIC PECULIARITIES, AND THEIR BEARING ON THE STORAGE OF NEGATIVES.

The very remarkable atmospheric conditions which have prevailed for some time past have exemplified in so pointed a manner some of the dangers which beset one at this period of the year, that I have thought a few jottings on a question whose connection with these meteorological phenomena is very close—I mean the storage of negatives—will be found acceptable. I take a considerable interest in noting the changes of weather, &c., and their effects upon photographic manipulations, and I have done so now for a long time. But I never remember a season showing such marked peculiarities—destructive peculiarities—as far as regards the taking of negatives, as the present one.

I may note a particular instance as an example of what I am referring to. My studio was closed, so far as the taking of negatives was concerned, from the Christmas Saturday evening till Thursday morning, not even the care-taker entering it; the hot-water pipes were emptied for fear of a burst from frost, and there was, consequently, no artificial heat of any kind to keep up the temperature. Upon my entry on the Thursday morning the studio presented a most extraordinary appearance—one which I had never before seen, and one which was a warning to me never again to leave my operating room so long without heating. My first thought was that there had been a universal leaking of gutters and window sashes; for every square inch of wall-paper was black with moisture, the dark-room door was positively running down with it, and on the camera-stands were actually small pools of water which had run off the side of the cameras and collected close to their bases. The oilcloth-covered floor was as wet as though newly washed, and the whole place was dank and miserable; the very rod which I use for moving the curtains was sticky and wet, and not even chairs and tables were free from the general invasion of wet. The variations of climatic conditions according to the locality are, no doubt, very great; yet I entertain like doubt that my own experience must have been shared on that particular day by a multitude.

The cause is very easy to find, as is also its remedy—a slight consideration of the two showing their bearing upon negative storing. During the first three days of the time named it may be remembered that a sudden change of temperature occurred, keen frosts and clear skies prevailing; but upon this supervened, with great suddenness, atmospheric conditions of a very opposite character. Within a very few hours this cold, dry air was replaced by an atmosphere warm and moisture-laden to an almost unprecedented degree. The result is easy to perceive. The air was almost saturated with invisible aqueous vapours, and in consequence the various articles in the studio and the studio walls themselves did not arrive at an equality of temperature with the surrounding air for some time. As a matter of course, in the same way as dew is formed, they cooled the layer of air immediately contiguous to them and it deposited the amount of aqueous matter it could not contain under lower thermometric conditions.

It is obvious that the only method of obviating occurrences of this nature is to prevent the temperature of the room and its accessories falling to so low a temperature, which can only be done by keeping the fires going more or less as long as can conveniently be done during cold weather, and to prevent radiation as much as possible by well drawing the blinds over the glass—a precaution which I always adopt at this season, as it produces a marked difference on a morning following a night of unclouded sky, when cold produced by cold is in the ascendant. I have observed a similar occurrence, but to a modified degree, in the middle of summer; in fact, it will always take place when an object is introduced into air at a higher temperature than itself, but whose dew-point is little, if at all, distant from that temperature; and the explanation itself suggests the remedy.

Now, to pass on to negative topics: it does not require a vivid imagination to conceive the dangers to a collection of *clichés* when these atmospheric conditions prevail, the only ways of guarding against these being either the keeping the negatives warm or protecting them entirely from atmospheric influences, if possible. The latter plan undoubtedly, if feasible, is the better one; but it is fraught with difficulties, and in places where repetition copies are often called for it would be a serious drawback to celerity of working.

It is now very many years since I first thought this subject out to my own satisfaction. I was led to it by discovering a disastrous number of negatives entirely ruined. I was at that time under the impression that large grooved boxes were the best form of receptacle. I had a large number of them made to hold one hundred each, and they had been in the boxes some time before I discovered the injury they were suffering, and which manifested itself by a raising of the film from the glass in small ridges whose intersections gave the appearance of a honeycomb. These cannot be cured, but to some extent they can be doctored up by heating the plate thoroughly, so that the finger can only just bear its heat, and then carefully pressing the ridge in a perpendicular direction till the heat-softened varnish flattens down. It does not do to print from these negatives at once, for they always get injured, in spite of the greatest care, in a very short time.

My explanation of this damage is that when a damp atmosphere, as explained above, follows long-continued cold, the plates part with their heat so much as to induce the deposition of moisture, as explained; for the best-constructed boxes are not air-tight, and the damp air would not be very long, even in the closed boxes, in permeating through the crevices, while in the open boxes they would instantaneously be in contact with the moist atmosphere. This damp, be it remembered, is in the form of vapour, but when on the negative it is in the form of a liquid; and so, in conjunction with the nearness of the glasses, rapid evaporation being prevented afterwards, this liquid remains upon the varnish for a considerable length of time. I think I need not say what will be the effect of long-continued applications of water to any negative.

1. The method of placing the negatives in paper bags and leaving them against one another is a great protection; but it is very tedious, and troublesome whenever a back negative has to be found.

2. Another method is to wrap them in parcels of fifty, place pieces of blotting-paper between each, and mark upon the outside the two extreme numbers of the negatives it contains. This, practically, avoids also the access of air to any individual plate, but is a great nuisance when back numbers are at all frequently asked for.

3. My own plan is simply to place them in grooved racks open freely to the air back and front. A large series of shelves divided by uprights into partitions large enough to hold one hundred negatives comfortably is fixed against the wall, so as to allow a free circulation of air; and, to prevent the incursions of spiders, &c., a piece of thick, coarse, open canvas is stretched on the wall side of the rack, and the front is left *quite open* to the air, and has no covering of any sort. After the lapse of a certain length of time—about three years—the negatives begin to be much less frequently referred to, so that then a little trouble in finding them is not felt. I then have them taken down and wrapped up according to method No. 2, and the shelves, &c., numbered for the reception of the later negatives. So far I have not lost a single negative from damp, and I see no reason for believing I ever shall. G. Watmough Webster, F.C.S.

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CARBON PRINTING.

[A communication to the Photographic Section of the American Institute.]

At first I intended to demonstrate before you the process which forms the subject of my remarks; however, I thought it would be better to explain first the theory of the same and to let the practice follow. Being at present unfortunate in having the pigment tissue of only one tint, I could not demonstrate *ad oculi* what variation in colours and tones pigment printing allows in photography. In carbon printing we make use of four different kinds of paper:—1. The pigment tissue. 2. The transfer tissue for single transferring. 3. Transfer tissue for double transferring, or "*transport définitif*" (in French). 4. The india-rubber paper, or flexible support.

1. *The Pigment Tissue.*—This is a paper uniformly coated with a compound consisting chiefly of gelatine and a pigment. It also generally contains a small admixture of glucose, soap, and glycerine, for the purpose of rendering it more flexible and more readily transferable. Fine lampblack or good india-ink ordinarily forms the basis of colouring matter, but to this other pigments are added in

order to produce differently-tinted tissues. The photographic tints—*i.e.*, those resembling gold-toned silver prints—are produced by an addition of brown, red, or violet colours, such as sepia, crimson lake, Venetian red, ultramarine, &c. Red chalk drawings may be imitated by using Venetian red as a pigment, sepia effects by sepia itself, and by the use of graphite as a pigment the effect of a drawing in lead pencil may be produced. In fact, by employing various pigments, or mixtures of such in changing proportions, pictures in any colour and tint can be made; and, furthermore, by the addition of a large proportion of colour to the gelatine a vigorous print may be obtained from a feeble negative, whilst, on the other hand, soft and harmonious prints may be produced from hard negatives by the use of a tissue with a small proportion of colour. The reasons for this are obvious—the greater the amount of colour present in the film, of a certain thickness, the deeper will be the tint, and the less the proportion the more delicate will the tones be. In my experiments I have found that with the ordinary paper, as now in commerce, such as manufactured by the Autotype Company in London, and by Adolph Braun and Co., in Dornach, the best results are obtained from a vigorous contrasting negative rather than from a soft one.

The pigment tissue, before being sensitised, will keep *ad infinitum*. It should be preserved in a cool, dry place; for when left in the damp it will absorb moisture and may even become mouldy, and in a hot place it will curl up and tear readily in handling. In operating with this paper we must always bear in mind that in cold water gelatine swells only, without being dissolved, while it goes easily into solution, even in tepid water. At a temperature of 100° F. it becomes fluid, so that it may be filtered, but becomes solid again in the cold; but when softened with water the gelatine melts at 65° or 70° F. This property of the gelatine is the reason why so many fail in carbon printing during hot weather, because the gelatinous compound with which the paper is covered will readily run down if hung up, even if the paper have been sensitised in an ice-cold solution. In the hot season the sensitising and drying of the tissue should therefore be conducted in a perfectly cool place, or it should be laid on perfectly horizontal glass plates and exposed in an airy place. It may be of importance to state, what to my knowledge has not yet been mentioned in connection with carbon printing, that during thunderstorms in summer gelatine is liable to be decomposed.

With tannin and combinations of alum it forms insoluble compounds. With perchloride of iron it becomes insoluble *in the dark*; but under the influence of light it becomes soluble again, thus rendering it possible to produce pictures from positive *clichés*. I shall, however, devote my attention especially to the deportment of gelatine towards chromic salts, the carbon printing process being entirely based on the same.

The Sensitising.—The salt almost exclusively used for this purpose is the *bichromate of potassa*, $K_2 C_2 O_7$. It is derived from the chromic iron ore—a mineral occurring in the United States in California and Maryland, and abroad, especially in Norway, France, and Russia. Before the year 1820 the chromic salts found only little application; now they have become of the utmost importance in various branches of industry, such as dyeing, calico printing, for the manufacture of colours, mineral colours as well as aniline dyes, for the bleaching of oils, the production of steel, &c.

Bichromate of potash is readily soluble in water in the proportion of 1 : 10, and keeps perfectly intact. The solution may be exposed to light for years without being decomposed in the least, but in presence of certain organic substances and by the action of light it is decomposed; and, singularly enough, this fact was discovered in the same year in which Talbot published his invention of silver printing, yet universally used in photography. But I may with certainty affirm that if carbon printing had at that time reached its present perfection it would now be impossible to introduce silver printing in photography.

With regard to the combinations formed by the action of the two compounds mentioned, it was formerly supposed that the gelatine was oxidised by the oxygen liberated from the bichromate; but Mr. Swan has demonstrated that the gelatine is rather rendered insoluble by forming a combination with the deoxidised bichromate, and not by directly combining with oxygen, *for the solubility may be restored by strong oxidising agents*, and we thus possess means to bring over-exposed prints back to the proper depth. I would propose to employ for this purpose *ozone*—an oxidising agent also used for restoring engravings that have become yellow in the progress of time. But chromated gelatine is not only rendered insoluble in the light but also in the dark, and, as I have found, especially during hot weather. According to Dr. H. Vogel sensitised tissue becomes insoluble after a week, when left in the dark, and Simpson states that he has kept it for a fortnight without change; but I suppose this depends, also, upon the quality of the paper. Slow drying aids decomposition; in any case it is best to use the tissue on the first or second day after sensitising. This manipulation is best effected in a nearly saturated solution of the bichromate in water, *i.e.*, in one of the proportion of 4 : 100. Some add to this solution a little ammonia, it being stated that the tissue thus becomes more sensitive. If this be the case, and when more sensitiveness is desired, I would give preference to the *bichromate of ammonia* or to the *double chromate of potash and ammonia*. I understand that the Autotype Company in London is selling a salt which is a mixture of equal parts of the ammonia and potash salt. I have used such an one with much satisfaction in the heliotype process, but of its action in carbon printing I cannot speak from experience.

The paper is only immersed for about one and a-half to three minutes, for if left longer it loses toughness, and dryness is retarded by the large quantity of liquid absorbed. In summer it is absolutely necessary that the solution be perfectly cool; and this is best effected by placing the same in a refrigerator prior to its use—not by placing ice in it, as by repeating this operation the liquid would become too diluted. In a warm solution the coating is readily removed. As to the drying, it takes place much quicker when the surplus of the solution is removed by laying the tissue upon a glass plate, the prepared side towards the glass, and then by going over it with the squeegee. In this case it will dry in one hour—of course, when hung up; otherwise the drying requires at least two hours, generally three. In winter and during damp weather it is best to heat the room. In sensitising seclusion from daylight is not required; but the drying must, of course, be conducted in the dark room. Small sheets are best hung up with clips; large ones should be laid on cardboards hung over a stick. After the lapse of an hour they can be hung up like the former.

The tissue for *single transfer* is an ordinary paper with a coating of gelatine. If no gloss be desired a solution of five to seven and a-half per cent. is taken; for pictures with gloss one of ten per cent. The dry sheets are subjected to a pressure in a hydraulic press.

For flexible support such a paper is coated with a varnish consisting of 500 grammes of bleached shellac in five and a-half litres of water, to which previously 120 grammes of borax and thirty grammes of soda carbonate have been added. After drying the sheets are rolled between metallic plates.

The paper for double transfer is essentially a gelatinised paper containing barytes-white (carbon of barytes), which had been partly rendered insoluble by chrome alum. ADOLPHE OTT.

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THE APPLICATION OF CERTAIN RULES TO COMPOSITION.

It has often been contended that by observation of certain rules of perspective and composition pictures possessing all artistic excellence could be produced. To prove how far this hypothesis is correct it is only necessary to compare two pictures—one being made by an artist in accordance with his taste and experience, and the other by a man whose only guide is the rules laid down for composition and arrangement.

The artist may possess but little manipulative skill and have only a limited knowledge of practical photography. The photographer has all this at his fingers' end and produces his pictures faultless in chemical effect, light, exposure, &c. If made by rule they may be geometrically correct and in accordance with the rules alluded to, but what a difference there is in the results of the two men! The latter, examined closely, will be found most carefully arranged in the least important parts. Every finger is in its proper position, and not an earring, bow, or bit of lace out of its proper place. Each little fold in the drapery is arranged with painful mathematical exactitude, and a loose hair would, in the opinion of the photographer, mar the effect of the whole picture.

Place the copy at a sufficient distance to prevent one's seeing all the little perfections (?) and lines and general arrangement at once appear harsh and broken.

It is a common error amongst photographers of limited artistic ability to pay too much attention at first to the minor points of a composition, destroying all its grace and *négligé* appearance.

It inevitably occurs that those men who study more the *tout ensemble* of their compositions fail to notice the minor points; indeed, were they to do so, the whole vigour of the picture might be lost in the time spent in attending to such matters. We allude now principally to groups and portraiture. Take, for example, a group of children. They can be very readily posed gracefully and in such relation to each other that they present at a little distance a pleasing, natural pose. But try to arrange the little ones' fingers, the folds in their dress, hair, feet, &c., and by the time the operation is finished the children are fatigued and have moved, or, in trying to remain as they were placed, appear so unnaturally stiff and graceless that all the charm of the picture has vanished. If the photograph is a good one each face will be perfectly modelled, proper contrasts exist throughout, and the lighting perfect; but one indescribable quality is deficient which might have been secured by exposing a plate before attempting the rearrangement.

We do not mean to say that all details should be neglected, nor that they are not necessary to the production of perfect results; yet it will be conceded that it is better to sacrifice these than the principal effect. We have a most conclusive proof of this in the works of the old masters—superb in their original state, and bold and masterly in execution. Finish them finely and they no longer possess a charm. As these are made so should every photographic composition be; that is, to be viewed at a distance and not examined closely. To gain this end there can be no doubt of the advantages of versatile practice.

Many men put it down as a self-evident proposition that if a man has a little knowledge of many things such knowledge does not conduce to perfection in any one—that "Jack of all trades and master of none" does not appear to apply to photography. A man's success in one particular branch is no criterion that his knowledge is limited to it. The fact of his success is often evidence of his varied experience, which has given him opportunities to select that path to which he is best adapted. If, therefore, those who aspire to gain reputation for their compositions would give some attention to art-principles, and not strive to arrive at artistic results by any mechanical or mathematical means or rules, their success would be more marked and their productions more creditable.

To compose anything at all presentable it is not only advisable but necessary that every photographer should have some artistic training; and although he may not be an artist innate, if by association with artists and careful observance of the means they resort to to put life and meaning into their pictures one cannot become imbued with the principles of art, no amount of practice of stipulated rules can be of any avail. About the only reliable rule for composing is to keep the lines and lighting under control and in proper keeping with the subject, and until this is accomplished leave the rest alone.

Once there exists a correct appreciation of the relative positions of objects in a picture the rest comes naturally, as they are auxiliary points and natural to all artists. As a man who can compose a picture artistically in the rough (so to speak), whether upon canvas or in nature, must be an artist, his eye will soon detect any striking faults in the minor details. When this transpires it will be quite time to give more attention to these points.

In conclusion: try neither to copy others' compositions (which may be faulty) nor to make pictures by rule, as both are equally impossible. BURROWS and COLTON.

PHOTOCHROMY.

I HAVE just read in THE BRITISH JOURNAL OF PHOTOGRAPHY of the 29th December an interesting discussion, which took place at the meeting of the Glasgow Photographic Society on the occasion of the exhibition of a number of photochromic proofs obtained by my process.

The honourable members of the Society who took part in the discussion gave, on the whole, a tolerably accurate description of the nature of my process; but where they are, perhaps, beside the facts is in losing sight of the difficulty which exists in combining a series of operations with a view of obtaining a sufficiently exact reproduction of the object to be copied.

In order to judge of the crowd of details it is necessary, in turn, to study, and, of the numerous difficulties to be overcome, all that is required is to set to work and attempt to realise the commercial and industrial application of photochromy.

As respects the assertion relative to a method indicated by the late lamented Mr. Sutton, consisting of applying colours to the back of a carbon print developed upon glass: it was communicated to me as far back as the 13th December, 1873, by Mr. Sutton himself, entirely in consequence of communications he had received relative to my process. That method of treating individually each proof can be neither commercially nor industrially successful; besides which, it does not permit the production of effects similar to those obtained by my process.

At the same meeting it was stated that the Woodburytype would be found the best method of working my process. This I have never denied, and it was for this reason I mentioned that form of photo-mechanical printing as applicable to my process, either in my patent of 23rd December, 1872, or that of 12th March, 1874. It is very certain that the facilities offered by this process, as well as by the method of impression in fatty inks for obtaining mechanically my various monochromes, can never be forgotten by me.

Passing from theory to practice, I have just established *ateliers* for working the Woodbury process, where, after the end of January, I shall realise the full advantages to be derived from this mode of carbon printing when applied to the production of photochromic proofs.

According to the usual fashion it is possible to dispute the value of my photochromic work; but it is absolutely beyond dispute that it is a method without a rival for the production of natural and pleasing effects such as can be obtained by no other method.

To those who believe that it is an easy matter I reply, with all the authority conferred by considerable experience on the subject, that there is *a world* between the general theory of the process and its practice. I would also express my extreme gratitude to all my critics because they force me to seek unceasingly to merit less their adverse criticism. LEON VIDAL.

NOTES ON PASSING EVENTS.

By a Peripatetic Photographer.

How does it happen that one gets into a pondering, contemplative mood at the commencement of a new year—looking forward to changes that may impend, and losses that may occur in the circle of friends during the ensuing twelve months? Viewing this matter from a philosophical point of view, ought not this feeling to pervade one quite as strongly when Aurora inaugurates the day each twenty-four hours as when, according to the ALMANAC, a certain day is nomenclated (the word is my own) to serve as that upon which a new year is supposed to be initiated? Still, whether from the *dictum* of the ALMANAC, or from a certain kind of sympathy existing with popular prejudices, people of even the hardest-headed types do get a-thinking inchoately at this period of the year about what looms in the future of the ensuing twelve months. I know that some who, a year ago, read the random utterances of the "Peripatetic Photographer" with a certain amount of interest have—ceased to exist; of how many more may the same be said when 1878 dawns upon the photographic world? However, whether our time in this sublunary sphere be long or short, I wish all my readers—"the compliments of the season."

The lawyer said to his unfortunate client—"They can't put you in the stocks." "But," said the client, "whether they can or no, here I am—*in* the stocks." "Nay," said the lawyer, "it is quite contrary to the constititution to put a man in the stocks, and they can't do it." "Nevertheless," replied the victim, "you see that I am fast here." Such was the kind of idea which passed through my mind on reading all that has been written about Young's oxygen generator. The Editors say that when making their trial of this apparatus they got a good light. "But," says the inventor of a rival apparatus—who, by the way, is my old friend, or rather opponent, Mr. Birrell—"it *cannot* make the oxyhydrogen light." To which the Editors are presumed to rejoin—"Very likely it cannot; but, meanwhile, it *does* give this light." The Editors—good, decent souls!—don't want to give offence, and so they ask what they are to do when such antagonistic authorities are *tout au contraire*—their own knowledge of a thing on the one hand, and on the other a theoretical statement as to its impossibility. Here is a way to cut this gordian knot: they must become metaphysical, and say—"Seeing is not *always* believing; perceptions are fallacious; nothing really exists, it only seems to exist; man does not see, he only seems to see, *ergo*"——but I proceed no further. The public, however, will be much delighted with any simple means of obtaining such an excellent and powerful light as that which proceeds from the impact of oxyhydrogen upon lime.

The photochromatic process of M. Leon Vidal is being pushed to the front. The Editors of this Journal will have much to answer for if they send a collection of prints to the meetings of all the societies, and there will be no end to the surmises indulged in as to the practicability of producing such prints on a commercial scale. That they are produced by the first process indicated by M. Vidal, viz., that of superimposing a number of films each containing a colorific contingent of the whole subject, is an idea that must now, I imagine, be discarded. I give my guess and allow it to pass for what it may eventually prove to be worth: it is that the prints are produced by chromo-collography, and not by pellicular superposition at all. Stenochromy, if carefully applied to photography, is likely to prove a powerful agent in the production of photochromes; but, so far as I can see, the preparation of the printing-block employed in stenochromy must be attended with much difficulty and expenditure of time and materials.

The practical application to emulsion plates of Mr. Sutton's suggestions *re* moist preservatives will ensure for Mr. Peter Mawdsley a goodly meed of thanks from numerous individuals who would like to make a compromise between wet and dry. If I read aright, it is claimed that by means of a solution of glycerine and albumen in water, applied to a plate coated with a bromised emulsion which has afterwards been washed, all the sensitiveness of wet collodion, coupled with keeping properties and facile development, is obtained. Still, for development in the field a tent is undoubtedly a nuisance; but this will soon, in these progressive times, be got rid of. The developing-box of the future must be something that can easily be attached to the back of the camera, to be stored away inside when not required.

M. Prat may back up M. Scottelari to doomsday, but neither the assertions of the one nor the experiments of the other will ever convince me that a part is greater than the whole; for this is, after all, what is meant by their assertion that violet light acts more energetically than white light. Let me make this plain:—A beam of white light of (say) twelve inches diameter possesses a certain amount of photographic force. If, now, this beam of light be made to lose, in the course of transmission, certain elements by having these colours filtered out, does this beam gain power as a whole? Verily, no! The interposition of a violet plate of glass will prevent the transmission of all but the violet rays; but will these possess a power *greater* than they had when mixed with other rays? By no means!

The method of increasing the intensity of feeble emulsion images, proposed at the last meeting of the Photographic Society of Great Britain by Captain Abney, is one which possesses so much originality as to render it the most valuable suggestion in this direction that has yet been made to the Society, and, small matter though it be, must be held to stand at the head of those brought under the notice of that Society during the year just brought to a close. After a plate giving a feeble image has been exposed to light it is coated with an emulsion of an intense character; the developer then brings to light an image in *both* films. In this we have much food for thought, and much more for tentative verification.

PICTURE HANGING.

Picture hanging seems to be one of those offices which in itself possesses the unenviable quality of never giving entire satisfaction. Whether it is so or not is a moot point; at any rate, an exhibition of the works of various artists never takes place without the same old tale being dinned in our ears about bad or unfair hanging. Why is this so? Is it because exhibitors hold their own works in much higher estimation than the hangers do? or is it that of a plethora of good work some must be placed in inferior positions? or, again, is it owing to the incompetency of the committee selected for the purpose? I will not take upon myself to fix the shortcomings on any one of these causes, but it seems probable that it is one or the other of them; certainly there is no denying that picture hanging as a rule causes much dissatisfaction to the exhibitors.

The remarks I am about to make are instigated by a paragraph in The British Journal of Photography, some few weeks back, by that versatile critic, "Free Lance," who took exception to my statement on the subject of hanging, and which escaped my notice until the other day. I will confine myself more particularly to the hanging of photographs.

In the first place let us see what are the conditions and difficulties with which a hanging committee has to deal. These, I think, are comprised in the number of works, the quality of the works, and the construction of the frames enclosing them. I will take for granted suitable premises and appliances are at hand, and the consideration is the disposition of the pictures.

With regard to the quality of the pictures: none are rejected on account of badness of quality. This induces another difficulty in the matter of number; for the greater the number the more difficult it becomes to place equally deserving pictures in equally good positions. This, perhaps, is the greatest difficulty of all, and, in all probability, is the cause of most dissatisfaction. Then, again, in the matter of frames: an unsuitable frame may prevent an exceptionally-good work from occupying the position it otherwise would do, and to which it is entitled. On the other hand, photographs being monochrome there is, broadly speaking, little consideration required in the matter of contrast of colour; that is, the colour of one photograph is not so much injured by juxtaposition with one of a different tone as is the case with paintings, where one abounding in delicately-warm tints is hung side by side with another in glaring orange and red. The conditions to be observed in hanging photographs are, therefore, somewhat simplified.

We will assume that the care of the hangers is to give the best pictures the best places, and to arrange all in a symmetrical and pleasing manner, making most of the space at their disposal.

Now let us take a hypothetical case. A large number of pictures of an average quality are sent in; a twentieth part are exceptionally good—some three or four very much in advance of the rest—with the usual contingency of rubbish. The primary consideration is to show the pictures to the best advantage, and the rule, other things being equal, is to place the large pictures above the line; the rubbish may either be skied or made skirtings, the best pictures being placed on the line, and the intermediate spaces filled up with average work. This programme, to be fully carried out, necessitates all the pictures being delivered at the rooms before the committee commence their duties of hanging. On arrival they are looked over and roughly classified (or should be) to facilitate their final disposition. It is reasonable to think that if pictures are delayed in delivering until the hanging commences the position assigned will be somewhat faulty, and unavoidably so.

Suppose, now, an exhibitor sends in a dozen or so separately-framed small pictures of particularly good and artistic qualities: it would be more to the satisfaction of the photographer, and decidedly so for the photographic critic and admirers, to see those works arranged together so that the treatment of the different subjects could be carefully noted, besides the fact that a number of any particular class of small pictures hung together will present a more impressive and better appearance than if they were scattered broadcast over a room. This is, I think, a very important matter to be borne in mind. One single excellent picture is always worth seeing and studying, while a whole crowd of mediocre work only tires the eye and distresses the examiner in his disappointed search for something good. If, therefore, these small gems are distributed about amongst the rest they do *not* gain by contrast of this kind, and the real contrast is not nearly so great as if they were hung together; moreover, exhibitors of photographs produce them of the particular tint or colour they deem best suited to the subject, and the contrast of a rich brown with a cool grey is only to exaggerate each colour, which is detrimental and quite different to the producer's desires or tastes. This kind of contrast should, therefore, be avoided. For example: take a number of any small objects of a similar general appearance, but worthless in point of quality, although they would be the greatest contrast in this respect to one of exceeding excellence, were they all exhibited in close juxtaposition the good would be damaged sooner than improved by such contrast. The *one* would be lost amongst the *many*, and frequently prevent the worthy object being examined at all. A sufficient effect of contrast, for all intents and purposes, is the fact of such pictures being hung in the same room.

My idea of good hanging is that, in addition to symmetrical and judicious arrangement, each exhibitor's works, when consisting of several pictures, should be massed together, to preserve as much as possible the effect the photographer originally obtained. Country exhibitors are especially affected by this apparent change of colour. The usual light of a London exhibition room in winter being of such a different character to that in which the pictures were produced is often alone the cause of disappointment as to the appearance of these pictures when hung for public criticism, irrespective of being contrasted with others of an entirely different tint that merely adds to the difficulty and depreciates the quality of the colour in a manner that could not be calculated upon by the producers. If these little matters were attended to I think the probability is that greater satisfaction would be given to all, and the public would be much better enabled to judge correctly of each photographer's skill or incompetency.

E. Dunmore.

NEW EXPERIMENTS IN INTENSIFICATION WITH LEAD.*

The Drawing Off from the Glass of a Negative Intensified with Lead.

One unpleasant property intensification with lead has—which is of no moment to many, yet which must be mentioned, as it is of interest to others—namely, the firmness with which a negative intensified with lead and sulphur adheres to the glass, and the resistance which the very adhesive collodion film offers to the drawing off.†

Troublesome and tedious experiments showed us that no rubbing of the glass plates with wax, glycerine, castor-oil, paraffine, talc, and all that sort of thing would ensure the drawing off of the film by the dry method any more than with other intensified negatives; they serve, at most, when used dissolved in alcohol or ether, only to give the glass a better polish.

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* Concluded from page 619, vol. xxiii.

† We shall, probably have something more to say on this subject at a future time.

A substratum of thin raw collodion (containing half per cent. of cotton), and then a two-per-cent. solution of benzine and caoutchouc, is efficacious, or, better still, leather collodion (containing half per cent. of cotton and a few drops of castor-oil to every cubic centimètre) instead of the raw collodion. Glycerine, instead of castor-oil, is inadmissible here, since it renders the drawing-off of the film more difficult, and is worse than raw collodion alone. Upon a plate so prepared a negative is taken in the ordinary way, developed, intensified, &c., &c., and lastly, drawn off by means of gelatine or leather collodion, which may be done with the greatest ease. As very convenient we prefer the following method, in which use is made of the early-known and latterly often-recommended property of dilute acids, namely, its serviceableness in loosening the collodion film from the glass. One need not fear that the dilute acid will attack the lead-blackened and intensified negative if, after treating the negative, the acid be well washed off and not allowed to dry into the negative, as if light and air were allowed to act long upon it the picture might be bleached again.

Acidification before the pouring on of the benzine, caoutchouc, and leather collodion or gelatine is not, however, always available. The most serviceable method is Dr. Vogel's drawing-off process, by which an intensified negative, taken upon a plate cleaned in the ordinary way, is first coated with a two-per-cent. benzine and caoutchouc collodion, and, when that has dried, with leather collodion containing from three to four per cent. of cotton and from two to three per cent. of castor-oil. When the latter also has become dry run a knife round the edges and lay it in from five to ten per cent. dilute muriatic acid or acetic acid. In a longer or shorter time the film may be drawn off with ease, and should then be rinsed with water and stored away. Solutions of gutta-percha in benzine often dry turbid and are friable, on which account we give an absolute preference to caoutchouc. Solutions of gum arabic or gelatine used as a protection for the picture against the action of the leather collodion, instead of caoutchouc, we put aside, because they afford no better protection than the latter, while they have the disadvantage of dissolving by lying in the acid bath and even in water only, thus putting an end to the connection between the leather collodion and the picture, so that on an attempt being made to draw off the picture the film of leather collodion only comes off, the picture still adhering to the glass.

The plan of drawing off with gelatine only, by coating the negative with a warm solution of gelatine (generally containing an addition of glycerine), or by pressing on sheets of gelatine, and then, when dry, drawing them off, we do not advise for those negatives whose collodion film adheres so firmly to the glass, because one cannot make use of that excellent medium, slow and thorough acidification, when once the gelatine has been transferred; while, as soon as one sees that certain places still adhere firmly to the glass in pictures which one is attempting to draw off with leather collodion, one has only to replace them in the acid bath and with a little patience the result will not be unattainable.

Josef Maria Eder, M.D., and Victor Tóth, *Captain.*

THE LANGUAGE OF COLOURS.

The importance and, indeed, the necessity for a better knowledge of colours is now obvious to most thinking persons. In France the late M. Chevreul gained fame by giving more scientific exactness to the language applied to colours used in the arts, and his chart of prismatic colours has been proudly referred to by dyers and printers especially.

Taking the blue, red, and yellow colours of the spectrum and their mixtures, as best imitated by different pigments, his diagrams have served as a means of reference to coloured effects. In this country colour has had almost a literature; yet, still to be able to produce a tint at will, or give language which shall be sufficiently clear, are not easy tasks even to those interested in the subject. One great difficulty is the want of being able to produce, or to refer to fixed standards, colours of sufficient power to be easily procured, and be renewed, if these standards of colour become degraded by atmospheric causes.

The common people refer with readiness to colours which suit everyday life. The sky is blue and the grass is green. They can fall back upon such well-known objects as lavender and lilac. recognise the poppy as red and the rose as pink; and, for shades, they Plum colour and purple, and every shade of yellow, from the primrose, the butter cup, the orange, and intermediate tints, can be readily admitted at once. But for the purposes of the arts and science more precision is required, perhaps to be sufficiently obtained if our colours would only remain constant, or standards could be readily reproduced. There seems to be some hope that art and science are both able to place better standards now before the world.

A very interesting paper was read at the Society of Arts upon a mode of printing in colours called "stenochromy," the object being to produce at one printing every colour and shade of colour. These are prepared and laid down in the proper places, and all are printed off at once. At the outset about eighty colours and tints are prepared to hand, and these have been tried for permanence as to resisting ordinary heat and light. Eighty colours and tints are thus prepared and numbered. For example: a blue or red article may be wanted, when this scale is referred to by number, as blue No. 3, red No. 17, or brown No. 79. Thus, by correspondence, samples may be compared by an accepted standard.

Before this, however, Mr. Spottiswoode, F.R.S., had given his results to the world by papers read at the Royal Society, and a little treatise *On the Colours by Polarised Light*, containing his experiments made with most exalted apparatus of research; and, besides all the well known prismatic combination by superposition of plates of colours, he has described the means whereby even as many as two hundred and fifty-five colours and tints may be produced and referred to.

At the same meeting, in the discussion, I remarked on the necessity of a standard for whiteness in art and trade. This was endorsed by the meeting, and I referred to the gems being cut and used as standard examples of particular tints. Mr. Spottiswoode practically points out how the low tints—the neutrals, the greys, the russets, and the browns—are produced. In photographic practice these are the very tones that are valued. At this time the lamentable accidents by sea and land make prominent so many instances of colour blindness that the production of constant standards of colours and tints can alone give precision to language; there is, besides, the fearful percentage of calamities caused by the defective vision of *employés* on railway lines, foreign as well as British, where, on testing the visual perceptions of the men, seven per cent. in one and ten per cent. in another case were either incapable to distinguish colours or to describe them.

Conversationally I have been informed that it is held that five per cent. of persons are incapable of distinguishing colours, and five per cent. cannot match samples. The difficulty of obtaining a set of permanent colours can be estimated when we reflect that we shall require colours opaque or to be seen by reflected light, and others transparent or to be seen by transmitted light. In photographic practice work may be produced by persons not aware of their deficiency of this sense, or severely criticised by persons quite unconscious of their own defects, and difficulties and unexpected causes of irritation visit the photographer. He may thus be able to appreciate the advantages to be hoped from the possession of true standards and the truthful language of colours.

T. J. Pearsall, F.C.S.

FOREIGN NOTES AND NEWS.

On Recovering Gold from the Toning Bath.—On the Recovery of Chemicals from Carbon Waste.—On the Consumption of Albumen.—Carbolic Acid in the Bichromate Bath.—A Cement for Porcelain and Glass.—A Weatherproof Varnish.

The new year is not ushered in by any striking foreign novelty in the photographic line, the enterprise of inventors being in all probability checked by the present unfavourable concatenation of circumstances, to wit, the dulness of trade, the stormy weather, and the rumours of war. The principal subjects of interest discussed in the *Archiv* of the 1st Dec. is residues. There Herr Fritz Haugk discourses on a new method of precipitating the gold from an old toning bath, and Dr. J. Schnauss on the means of utilising the waste thrown off in the carbon, or, as he calls it, the chrome-gelatine process. As on the principle of giving honour where honour is due, we will first see what Herr Haugk has to say about the noble metal. Supposing the toning bath to be worn out he would subject it to the following treatment:—After filtering it into a *white* glass bottle he would render it alkaline with bicarbonate of soda instead of neutralising it with chalk, and then add by dropping a concentrated alcoholic solution of aniline red until the liquid had become a deep raspberry-red colour. The bottle is then placed for six or eight hours in a well-lighted window, at the end of which time the gold should have fallen to the bottom of the vessel in the form of a violet powder (suboxide of gold) and the liquid should have lost its colour. The latter, being useless, must be carefully poured off. The precipitate is then stored away until another toning bath is worn out, when the latter is poured directly into the same vessel above the precipitate previously obtained, and subjected to precisely the same treatment.

When a sufficient quantity of auric suboxide has thus been accumulated it is placed on a filter, washed well, dried, and incinerated. The ashes are then dissolved, at a gentle heat, in excess of *aqua regia*, and the solution is diluted with distilled water and the undissolved residue filtered off. Lastly: the filtrate so obtained is evaporated until dry, the product being almost chemically pure chloride of gold.

On the sides of the white glass vessel in which the gold is precipitated a crust of gold forms with time, which, when it has become pretty thick, should be removed. For this purpose the gold can be quickly and conveniently dissolved by pouring a little *aqua regia* into the bottle, shaking it up, and placing it in warm water.

Dr. Schnauss's information is not so cut and dried and ready for use, but he seems to have made some interesting experiments in the direction of utilising the waste from carbon prints, and though he has not yet concluded his investigations he has seen enough to convince him not only that the residues can be recovered, but that the recovery is worth the outlay of trouble and expense—a great step towards the ultimate reduction of the present high cost of production of carbon prints.

He gives as an example of his procedure his attempt to recover chromic acid from the washing water of lichtdruck plates. As for the preparation of the latter, he uses almost exclusively the ammoniac bichromate, which is about ten times as dear as the potassic bichromate. He tried to recover the ammoniac salt by precipitating the gelatine (which is only present in a small quantity in the cold solution) by tannin, by evaporation, remembering that for the first washing of the plates but little pure water is used, and that part of the bichromate loses its chromic acid by exposure; but the mass of salt obtained contains too much organic impurity to be made use of again. Dr. Schnauss was more successful in precipitating the chromic acid as chromate of lead by adding a solution of sugar of lead to the first washing water, to which a little acetic acid has been previously added to throw down the bicarbonate of lime. The chromate of lead is precipitated with a more beautiful and intense colour from a concentrated than a diluted chromate solution, especially if, when using spring water, the formation of carbonate of lead be checked by an addition of acetic acid. The price of the acetate of lead is about one-fifth of that of the chromate of lead, but from that the water of crystallisation in the former must be allowed for when computing its value. By collecting the developing water used in the carbon process in a large vessel the colouring matter was deposited at the bottom in the form of an almost impalpable powder, utilisable for many purposes.

The foregoing experiments by Dr. Schnauss are more suggestive than conclusive; but they are comforting, in so far as they go, to those economically-disposed persons who act upon the saying that "a penny saved is a penny gained." Indeed, considering the outcry that has been made as to the great cost of working the carbon process, it is a matter of wonder that the recovery of waste chemicals in this department has not already been vigorously taken up; but probably carbon printers have been too much engaged in overcoming the difficulties of producing perfect prints to have time for economical considerations.

According to the *Mittheilungen* Herr M. G. Witz has collected some interesting particulars as to the consumption of albumen and the attempts made to produce this material from the blood of animals slaughtered for food:—"An enormous quantity of eggs are annually consumed as food, and, as our readers are aware, the quantity required for manufacturing purposes is not small either. In the preparation of leather the yolks of eggs are largely used, and in photography the whites. Calico printers also use large quantities of albumen. In Alsace alone, where there are large calico-printing works, the albumen of about 37,500,000 eggs is consumed annually—that is, about as many as 250,000 hens could lay. The more blood albumen that can be used for these purposes of course there will be the less egg albumen required, and the cheaper the latter will be. Herr Witz says that the Alsace calico printers offer a considerable prize for the discovery of a good and cheap subsitute for egg-albumen, but as yet without the desired result; so that they must still continue to use great quantities of eggs which might otherwise be used for food or for photographic purposes. In the calico-printing establishments experiments were made with caseine and india-rubber, but the colours printed with this mixture were not very fast. Tench proposed to replace egg albumen with that extracted from the roes of fish, but this plan was found impracticable on account of the impurities contained in the latter. Blood albumen is, however, much used along with egg albumen; but this cannot be done with light or clear colours, as, on account of its impurities, it darkens the colour. From the blood of an ox or a cow about 400 grammes of dried albumen can be prepared. It has been reckoned that if the blood of the animals slaughtered in Paris in the course of a year were worked up it would furnish as much albumen as seventy-two million eggs. One kilogramme of dried albumen represents two and a-half oxen, or ten sheep, or seventeen calves, or 366 eggs. For the preparation of albumenised paper for photographic purposes blood albumen can scarcely be used on account of its dark colour, yet when mixed with bichromate of potassium it can be employed in various photo-mechanical processes. In Passau, on the Donau, the manufacture of blood albumen is carried on to a very large extent; consequently this important material has considerably fallen in price, and the large quantities of eggs formerly collected in central Europe for their albumen are now available for other industrial purposes and for food. The albumen prepared and dried at Passau is, for many purposes, in all respects equal to fresh-egg albumen, and it is quite possible that even for photographic purposes it may replace the latter."

In an article in the *Monatsblätter* on the employment of carbolic acid in the preparation of carbon tissue, Herr Ernest Friedlein says that it cannot be too highly recommended. In the summer time he found that the tissue he prepared decomposed rapidly and became unusable, besides having an unbearable smell, but that after he added carbolic acid it kept as well as in winter. Some persons with delicate noses, to whom the use of a small percentage of carbolic acid had been recommended, objected to its odour, and tried to replace it with salicilic acid, but he has always found the carbolic acid quite good enough and suitable. His chrome bath is of the following composition:—

Bichromate of potassium	120 grammes.
Distilled water..........................	3,200 ,,
Liquid carbolic acid....................	4 ,,

To sensitise the paper let it float from half to three-quarters of a minute upon the bath.

In the same journal the following cement for glass and porcelain and waterproof varnish for wooden baths are given:—

Rub down and mix with linseed oil—

Litharge of silver	3 parts.
Fresh quicklime	2 ,,
White bole	1 part.

The waterproof varnish is prepared by stirring, until dissolved, one part of gum elastic into thirty parts of hot coal-tar naphtha. To the solution, which should be of the consistency of syrup, sixty-four parts of powdered shellac should be added, the solution being, meanwhile, still kept warm and constantly stirred. Then pour the hot solution upon stone or metal plates and let cool. To use, melt the mass gently and transfer it to the bath or other article, which is to be made water-tight.

Meetings of Societies.

THE PHOTOGRAPHIC SECTION OF THE AMERICAN INSTITUTE.

At a meeting of this Section, held under the presidency of Mr. H. J. Newton, after the transaction of private business, Dr. Adolphe Ott read a communication on *Carbon Printing.* [See page 4.] After the paper had been read,

The Secretary inquired if there was any difficulty in getting the paper into contact with the glass.

Dr. Ott said there was no trouble in this respect; the paper was rigid at first, but as soon as it had been sensitised it could be laid flat on the glass.

In reply to the Chairman,

Dr. Ott stated that the paper was from three to five times more sensitive than albumen paper. If the picture be taken in the morning it could be delivered in the afternoon. Warm and cold water were all that was required. The only operation that required skill was the squeegeeing of the paper, so that no air-bubbles remained. Both the papers were left in cold water and then immersed in warm water. Double transferring, of course, took more time.

Dr. M. N. Miller said that M. Lambert stated last spring that operators should prepare their own paper.

Dr. Ott believed that there was, on the contrary, much difficulty in operators preparing their own paper; great care must be exercised to have the ingredients properly mixed. Durable and stable pigments could only be used, and then the layer must be perfectly uniform. The whole process must be carried on in a cool place.

The Chairman inquired if *the paper* should not be kept in a cool place.

Dr. Ott replied in the affirmative; but care must be taken that it did not become mouldy. Gelatine and pigment were the principal ingredients of the covering of the paper.

Dr. Miller said that he had some sensitised paper on which the image could not be developed; it seemed as insensitive as sheet iron.

Dr. Ott stated that the gelatine might get damp, but it would not spoil on that account; there was some carbolic acid in it, which preserved it from moulding.

Dr. Miller remarked that the difficulty was in the transferring—the same as Albert had when he first commenced transferring.

Mr. Chapman inquired what change took place when the gelatine was decomposed by electricity during a thunderstorm.

Dr. Ott said he could not well answer that, but would infer it to be the same as when milk was spoiled from a similar cause.

The Chairman asked what was the effect on the paper.

Dr. Ott said that the paper looked just the same as before, but it did not act so; decomposition from that cause very rarely happened.

Mr. E. Bierstadt remarked that milk turned sour very quickly during a thunderstorm, and the action was just the same if the milk were placed in a sealed glass vessel.

Mr. Chapman said that whether it was the ozone, the vibrations, or the electricity that produced this change, they did not know.

Mr. Chisholm stated that if a current of electricity were passed through fresh eggs they would immediately be spoiled.

The Secretary asked Dr. Ott if he could give an approximate price what these pictures would cost the producer.

Dr. Ott replied that photographers in Europe charged more for carbon pictures than for albumen, though the cost of the paper was just the same, and there was less work to be done, and no gold or silver solutions to be used. In Europe the people would not be likely to take them if the price were the same as ordinary photographs. A single or double transfer, or a right or a left, can be made from the same negatives, just as was wished; and it could be enlarged, if desirable. In comparison with the ordinary negative a carbon picture on glass would be much finer, the molecules of lampblack being much finer than those of silver. It was very easy to colour pictures on this paper, as it had no albumen on it. The picture was placed in a solution of alum, which hardened the gelatine so that it could not come off, and it did not repel the water. If the picture were over-exposed it could be brought back with warm water; and in particular places, if desired, it could be made light by a jet of water with the wash-bottle.

The Chairman said the carbon process had been worked up to a great degree of success in Europe, but in their own country it had not been so. Several parties had worked at it for some time, but it now had been entirely abandoned. There was a gentleman here who worked it very enthusiastically and perseveringly some years ago, but he finally gave it up. Last winter a gentleman of the name of Todd exhibited some of his work here, and it seemed that his specimens were finer than he (the Chairman) had ever before seen; and he was in hopes that Mr. Todd would introduce the process, as he promised to do. He was going to start in that city or suburbs and take the negatives or photographs from the operators and furnish them with prints such as the specimens he exhibited. Some of his enlargements were very fine. He had not seen Mr. Todd since, but he understood that a building for working the process was erected at Jersey City or at Piermont. Whether Mr. Todd had succeeded or had given it up he did not know; but he hoped that Dr. Ott would fully succeed in establishing it among them.

The Secretary said that the gentleman whom the Chairman first alluded to was named Drummond; he worked Swan's process, and in some correspondence he had with Mr. Swan he stated to him that there was some difficulty with everyone who tried to work his process here. Mr. Swan replied that it worked well in Europe, and he proposed to come out and see what the trouble was. Since then they have had probably a dozen who had tried to introduce carbon work, and every attempt had been a failure. Mr. Todd exhibited some very beautiful specimens to them, but there seemed to be some difficulty in working carbon tissue practically. Now and then they heard of its working well in some out-of-the-way place, but nothing further. They had evidence tonight that it had worked well in their climate, and if Dr. Ott would furnish them what he had promised they would be able to do something in that line.

The meeting was then adjourned.

At a meeting of this Society on the 30th October,—Mr. H. J. Newton, in the chair,

Mr. Peter F. Weil said that, as the subject of carbon printing had been before the Section at its last meeting, he would state that Mr. Kruger and himself had recently been working in that line with considerable success. Mr. Nagle, of Hoboken, had also been practising the new method. Some time ago Mr. Kurtz, of New York, worked the process, but did not continue it. In regard to the keeping qualities of the paper he would say that in warm weather it did not work well. The paper became hard, like dried india-rubber, and this occurred just the same whether the paper be kept in the dark or in the light. The most trouble in working carbon tissue was found during warm weather. Dr. Ott used ice on warm days; a few pieces placed in or around the bichromate of potassium solution removed the difficulty.

The Secretary inquired if the paper had to be used on the day it was sensitised, or would it keep.

Mr. Weil answered that the paper should be used as soon after sensitising as possible.

Dr. M. N. Miller said that Dr. Ott did not claim that the paper would keep for a long time.

Mr. Chisholm remarked that Dr. Ott said that the best way was to sensitise the paper the last thing in the evening, and it would be ready for use the next morning.

The Chairman said that at the last meeting he promised to exhibit some of the negatives he had made while in the country during the last summer. He then showed quite a number of very fine 8 × 10 negatives made with his emulsion, some of which were more than six months old when used for preparing the plates. He said he also took with him twelve plates which had been prepared about five months, and he saw no difference in the working of the old and those freshly prepared. He (the President) also exhibited some albumen paper which had been sensitised about eighteen months. The paper had not changed in appearance in the slightest degree, it being as white as unsensitised paper which had been albumenised eighteen months. He also showed a print made on some of the paper that morning, which was as good in all respects as a print made on freshly-prepared paper. He said there had been no pains taken to protect this paper from the atmosphere; it had been rolled up in common wrapping-paper and laid in a drawer. He stated that a year ago last March he exhibited some prints made on paper which had been sensitised three months, and also some on paper which had been sensitised that morning; and it would probably be remembered by some that the prints on the old paper were quite equal to those on the new. The paper on which those prints were made was prepared the same as that which he exhibited that evening. Many efforts had been made during the last six years to prepare a sensitised paper which would remain without change, so that it could be made a commercial article, yet at that time there was none in the market in that country. There was a sensitised paper made and sold in France for some time, but he did not think it proved a financial success. It was prepared with collodio-chloride, which made it very expensive and difficult to manufacture. The preparation of the paper exhibited was exceedingly simple. It is sensitised in the ordinary way, and as soon as drained, and before it begins to curl, the edges are wiped dry; it is then floated for about one minute, back down, on water containing one ounce of hydrochloric acid to forty ounces of water. It required about double the fuming of paper prepared in the ordinary way. After it was more than three months old it required a pad with ammonia on it. A very effective and convenient way is to place over the paper, when in the printing-frame, a piece of cotton flannel, and on this lay another piece of flannel which has been wetted with ammonia diluted with an equal quantity of water and pressed as dry as it can be with the hand. The cover is then put on and left for two or three minutes and exposed to the light. Paper prepared in this way gave superior prints, especially when new. It prints with great brilliancy and with a rich, deep colour, and gives exceedingly clear and brilliant proofs.

Dr. Miller inquired how it compared in sensitiveness.

The Chairman replied that there was no perceptible difference in sensitiveness to paper prepared in the ordinary way.

Dr. Adolph Ott exhibited some specimens of polychrome prints, which, he said, were then made in France. The particular colour was not put on by the brush, but was in the paper itself, forming the background. The brown colour shown is in the paper only, but the flesh and light colour was put on afterwards. They were carbon prints, but made by a modification of the old Swan process, and were, of course, perfectly durable, like all carbon prints. The only difference between these polychromes and the carbon prints was that the former is on linen and the latter on paper.

The Secretary asked if these prints were not made by masking out —one colour masked over the other.

Dr. Ott said that was so. These polychromes could be made on the same press as the carbon prints. The process is patented throughout Europe, and is already in use in France, Germany, and Switzerland. Photography enters a new field by this process. These polychromes can be made by anyone who can handle a brush. The paper for this process is now manufactured on a large scale, and can be had at the same price as albumen paper.

The Chairman inquired if there were any printed formula in regard to working the process, or did it require personal instruction to work it.

Dr. Ott said certainly; it required a person to give instructions. It would be very difficult for anyone to work it from printed instructions; and he was there for the purpose of giving those instructions.

The Secretary remarked that the pictures were vere very fine; but he did not see that they were getting any nearer to the practical part of the matter. As Dr. Ott said he could not just now furnish the paper there seemed to be obstacles in the way of its becoming general.

Dr. Ott said that he could instruct a person in two or three days to make as good a picture as the one shown.

The Secretary: Now, Doctor, we come to a vital point; how much is it going to cost? Will it cost one hundred or five hundred dollars for a person to become acquainted with the process and have the right to use it?

Dr. Ott: About one hundred dollars.

The Secretary: Now, if it will cost one hundred dollars, can a person so instructed procure the machinery to work the process at once? and if he cannot purchase the prepared paper, can he make it himself?

Dr. Ott: Certainly, he can; but it would not pay any photographer to prepare his own paper.

The Secretary: There was some question about this paper not keeping; and if a large quantity of paper be on hand and it should fail, what then? It seemed to him that there would be some trouble here. Had Dr. Ott known these prints to peel from the paper?

Dr. Ott said that with the old Swan process this occurred, but with the improved method he had never seen any to do so.

The meeting was then adjourned.

Correspondence.

RAPID PRINTING.

To the Editors.

Gentlemen,—Will you kindly allow me a question on the subject of silver printing in the winter?

These short, dark, winter days, when often scarcely a proof can be satisfactorily turned out in less than six hours, have set my mind on the inquiry whether there is not some process within the many resources of photography which might remove the irksome and often serious delay consequent on the diminished power of the light. I am aware of the various mechanical processes which are now so largely in use; but these are manifestly beyond the reach of even many a professional photographer. I am also aware of the carbon process, in which there remains little to desire both in manipulation and effect; but the gain of time here is, after all, only as two to one on the silver.

Now, I have frequently seen enlargements in silver which, even before the finishing touch of the artist, seemed to me little inferior in sharpness and tone to the small pictures printed by contact. These enlargements, I understand, are effected by a process which involves only a few minutes' exposure to light. What is the "reason why" this process is not made available for the production of *carte* or cabinet pictures even in the summer? The sharpness, I should think, would be perfect, and that gloss which is the admiration of the print in albumen might find a ready substitute in various other materials. The gain in time would far exceed any increase in trouble and expense.

Supposing a picture of good quality could be obtained by this method the advantage of it might be shown thus:—A photographer has to print off twelve copies each of six portraits. He takes No. 1 portrait lens, copying camera, and prepared paper, allowing five minutes for each impression. He prints off twelve in an hour. He proceeds in like manner with the rest, and in six hours completes his task so far as the action of the light is concerned. Another photographer takes his six printing-frames and in six hours obtains one copy of each of the six portraits. At this rate he prints off the above number of seventy-two copies in twelve days. Perhaps this is a little exaggerated, so I will reduce the time of this latter process to one-half, and increase the time of the former to two, and then there would be a decided advantage.

Is there no dry method, as in the dry-plate process, by which exalted sensitiveness might be obtained for contact printing in the winter? Will you, or any of your readers, favour me with a reply to this question? The field of photography seems to have been so widely explored that I hesitate a little in putting the question; but the search after permanency has of late years so much engrossed the attention that it is quite possible that silver printing, on account of its alleged instability, has been doomed to a premature end.

I have prints in my possession which, after fifteen years of exposure, have lost none of their detail and colour, and evidence of a stronger kind than this has from time to time been presented in this Journal. I do not know what the prospects of carbon are in respect of sensitiveness and rapidity; but silver has already produced results in one process that ought to incite to perseverance in the other.—I am, yours, &c.,

Ibsley Parsonage, Ringwood, Dec. 29, 1876. Albert Jenkin.

[The solution of the difficulty here propounded is to found in camera printing on wet collodion (as practised by M. Disderi) on the one hand, and in printing by development on the other. By both may be produced charming results with a very brief exposure.—Eds.]

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

To the Editors.

Gentlemen,—Had your correspondent "William Brooks" taken the trouble to look at the *Journal of the Photographic Society* for February 16th, 1875, page 101, he might have saved himself the commission of a very serious error.

Further comment is needless from—Yours, &c., R. J. Friswell.

30, *Richmond Crescent, Barnsbury, N.*,
January 1, 1877.

ALKALINE DEVELOPMENT.

To the Editors.

Gentlemen,—I have just read an article by Captain Abney, published in the *Philosophical Magazine*, on the alkaline development of the photographic image, in which he explains the strengthening of a feeble image by the application (subsequent to exposure) of a second film. If I do not misunderstand him, he traces this strengthening to the fresh supply of silver bromide in the second film. He concludes by saying—"I have also previously pointed out that intensity may be given to an image by alkaline development if a silver compound soluble in the alkali be gradually added to the developer. This new method, however, seems the preferable one to adopt."

May I, through your columns, ask him why he prefers the new, more complicated, and (apparently) wasteful plan to the older, more simple, and economical one, the object aimed at in both cases being (apparently) the same—a supply of silver bromide?

The article I refer to is most interesting, and should be read by all photographers who care to understand the "reason why" of their results.—I am, yours, &c., J. W. N.

United University Club, Pall Mall East, S.W.,
January 3, 1877.

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Photography in Court.—At the last sitting of the Shoreditch County Court prior to the vacation, the case of Hawkins *v.* Toombs was heard before the presiding Judge. The case created some amusement in court, owing to the somewhat affected manner of the plaintiff. The action was brought by the plaintiff, a photographic operator, against his employer, who carried on business at Stoke Newington, to recover a month's wages, in lieu of notice, for an alleged wrongful dismissal. The plaintiff said he was engaged by the defendant at a stated salary, and had been in his employment a month, but that before the expiration of the second month he was summarily dismissed without receiving the money due to him, or even one month's wages in lieu of notice, which was mutually agreed upon between both parties; and as he had made several applications to defendant without success he was induced to bring the present action. In cross-examination by Mr. Seal, solicitor for the defendant, the plaintiff indignantly denied being too familiar with the lady sitters who visited his master's studio. He had only offered a little flattery, which ladies expected to receive; but that was only in the way of business, and to enhance his employer's profits. He did not consider himself an attractive young man; he was engaged to a young lady who came to the studio, but declined to give her name. This was the plaintiff's case. Mr. Seal called the defendant, who said he had had several complaints from customers of the plaintiff's undue familiarity with some of his lady customers, and in consequence of which he was induced to keep an eye on the plaintiff, who on one occasion, while posing a lady, attempted to kiss her, upon which the sitter at once left the studio and made a complaint to the defendant's wife, when the plaintiff was immediately dismissed. The young lady was now in court, and the defendant asked if she might be sworn. Edith Guy was then sworn and corroborated the defendant's statement, adding that she was the person who had complained to the defendant's wife. She had never seen the plaintiff before. This ended the defendant's case. The Judge said that as the plaintiff had been engaged to one lady he ought to have been satisfied. He considered the plaintiff a "gay Lothario," and the defendant, having a due sense of decorum, was perfectly right in dismissing the plaintiff. Judgment would therefore be for the defendant with costs. Applause in court greeted the decision, which, however, was immediately suppressed by the officers.

Light and Sound.—On Monday evening Professor W. F. Barrett, F.C.S., lectured at the London Institution on the subject of the analogy of sound and light. The lecture, says a daily contemporary, was illustrated with many beautiful experiments, in which the electric lamp and sensitive flames were employed. After remarking on the differences between the vibrations of light and those of sound, Professor Barrett passed on to treat of the analogy of law which they displayed. The extinction of luminous and sonorous sounds was effected in a similar way to that in which two pendulums swinging in opposite directions from a bar mutually counteracted, with regard to the bar, the effect which either would have produced. Two luminous waves of different direction uniting would produce darkness, two sonorous waves would produce silence, and two water waves would produce stillness. Light reflected from a mirror gathered into a focus, and sounds also had their focal distance from which they affected a sensitive flame. There was a striking analogy between music and colour; the rate of vibration in sounds gave rise to the gamut, and in colours the rate of vibration in like manner gave rise to the notes forming the spectrum. The colours of the spectrum showed a sequence analogous to the sequence of pitch in the gamut. Newton thought that there might be a correspondence between the length of the spectrum colours and the vibrations of musical sounds, but the true relationship was between the vibrating pitch of colour and the vibrating pitch of sound. The extreme limits of the spectrum embraced an octave in music. Calling red 100, the proportionate vibration of orange was 89, that of yellow 81, that of green 75, that of blue 69, that of indigo 64, that of violet 60, that of ultra-violet 53, and an obscure or extreme violet 50. The vibration of C in music corresponded to that of red in colour, and taking C as 100, the vibration of D was 89, that of E 80, that of F 75, that of G 67, that of A 60, that of B 53, and that of C 50. The vibration of unison, rendered visible, produced on a screen the figure of a circle, that of an octave formed a figure resembling 8, and combinations of figure formed by the visible reflection of intervals of a fourth, a sixth, &c., were proportionately complicated. This was shown by the lecturer by means of tuning forks and sensitive flames; and it was noteworthy that the figure of a discord was as perplexing to the eye as the sound was objectionable to the ear. The exquisite colour produced by permanganate of potash was composed of red and blue, colours which were in harmony, and this corresponded to a fifth in music. In concluding his lecture, which was listened to with great attention, Professor Barrett said that one of the most pregnant results of scientific investigation was the revelation it contained of order in all phenomena, so that the student of nature felt sure that its right interpretation could never put anyone to intellectual confusion.

OUR ALMANAC FOR 1877,

EDITED BY J. T. TAYLOR,

Will be published Tomorrow (Saturday), 6th January.

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Wanted, a quick-acting *carte* or cabinet lens in exchange for a ten-inch square portable bellows camera suitable for copying.—Address, J. HINLEY, Wynn-street, Birmingham.

A camera with six lenses and repeating back for one-ninth size photographs on whole plates, in good condition, is offered for anything useful in photography. Preference given to a good quarter-plate lens and camera for portraits, groups, or views.—Address, J. C. CLARKE, photographer, Alderburgh, Suffolk.

ANSWERS TO CORRESPONDENTS.

PHOTOGRAPHS REGISTERED—

H. Allinson, Leeds.—*Four Portraits of Mr. E. J. Jones.*

☞ *Correspondents should never write on both sides of the paper.*

⁂ With our next number we shall present the title page and index for the last year's volume as a supplement.

CALOTYPE.—Any dealer will supply you with the paper required.

RECEIVED.—Brinsmead's *History of the Pianoforte; The Sanitary Inspector*, No. 1.

FLEXIBLE (Manchester).—Thin sheets of gelatine are obtained by pouring the liquefied gelatine upon sheets of tin.

M. P.—The studio described will answer quite well; but seven feet will prove to be a better height than eight feet for the sides.

P. ERLY.—It is quite impossible to indicate the cause of the spots until we are made aware of the conditions under which the negative was taken.

T. J. LLOYD.—Our copy of *Hearn's Practical Printer* was obtained from Benerman and Wilson, publishers, Philadelphia. The price is two dollars and fifty cents.

AMSTERDAM EXHIBITION.—Mr. H. R. White would like to be favoured with information respecting the exhibition to be held in Amsterdam during the present year.

J. T. ANDERTON.—If we are not mistaken Mr. W. B. Woodbury has given in his *Science at Home* such directions as will enable you to construct the fountain in question.

OLD SUB.—The lenses are similar in general configuration, but are so different in other features that one cannot be made to supply the place of the other in the experiment recorded.

ONE WHO DON'T KNOW.—1. Lac varnish applied cold.—2. This kind of fog indicates a disordered nitrate bath.—3. Sensitise your paper upon a stronger bath, and see that it is slightly acid.

W. BIRRELL.—We reciprocate your good wishes. Of course we know very well that no feeling of a hostile nature you have towards Mr. Young; and we also know that hydrogen as well as oxygen is required in the production of the oxyhydrogen light.

H. L. (Stratford-on-Avon).—No advantage would be gained by the republication of the articles. Anyone who desires them can easily obtain the series on application at our Publishing Office, the whole of the numbers of the Journal containing them being still in print.

CENTENNIAL MEDALS.—We are glad to learn from Messrs. Mansell and Co. that a medal has been awarded to Mr. F. M. Good, for the excellence of his views of Palestine. Mr. Good's name did not appear in the official list from which our announcement of the prizes was taken.

C. E. (Paris).—Our correspondent desires information from some reader on the following topics:—1. What is the exact quantity of gelatine emulsion (Palmer's formula) necessary to coat an $8\frac{1}{2} \times 6\frac{1}{2}$ plate?—2. What is the best way to precipitate the silver in a sulphocyanide solution?

NEMO.—1. There is no difference between the two classes of lens mentioned by you—that is, no difference that we have been able to discover.—2. The lens named under this heading is similar to those in your first query.—3. Let the focus be *about* six inches, and the diameter not less than an inch and a-quarter.

B. W. PHILLIPS. You are very late in the field with your remarks about hœmatoxyline acting as a developer, as a period of nearly ten years has elapsed since this property was discovered by Mr. M. Carey Lea. From another remark in your letter we imagine that you have only recently entered the photographic field of research, and may, therefore, be unaware of much that has been discovered. If we are correct in this surmise we shall be happy to afford you an opportunity of examining the former volumes of this Journal, if you will call for that purpose any Thursday or Friday at our Editorial Office.

LIBERATOR.—After making due inquiry we arrive at the conclusion that a paraffine stove would be unsuitable for heating your studio. We have been present in a room in which one was burning, and the smell seemed somewhat objectionable. It is possible, however, that it may not have been burning under the best conditions.

C. J. W.—Various solvents are made use of in the preparation of a bituminous film upon which to impress a picture. Some prefer spirits of turpentine; others like benzole. Sulphuric ether was, at one time, much used as a solvent. In the preparation of the plates it is essential that the film be very thin, and that a sufficient exposure under the negative be given to ensure the film being rendered insoluble throughout its entire thickness. To ascertain the proper time expose a plate early in the morning, and after four hours cover a small portion of it from light, after six hours cover another portion, and so forth, allowing one part to be exposed for a day and a-half, or even two days during the dull weather now prevailing. Upon development the correct exposure will be indicated by the appearance of the image.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—This Society, at its meeting on Tuesday next, the 9th inst., at 5A, Pall Mall East (the Exhibition of the Water Colour Society being on view at the same time), will open with a discussion on carbon printing—the subject being opened by Mr. S. Fry.

SPECIMENS OF MOSS'S PROCESS OF PHOTO-ENGRAVING.—Familiar as we are with the highest development of the production of printing surfaces by photographic agency, both when obtained by way of experiment and also in the more extended range of commercial application, there was, in the latter department a "still higher height" of which we were unaware until we saw the productions of the Photo-Engraving Company of New York, whose *circular* for autumn, 1876, we have just received. It contains several specimens of printing executed from relief plates, produced by the special process (Moss's process) of photo.-surface block-making adopted by the Company, and, as we have hinted, we have never seen commercial work of the kind possessing such excellent qualities. One specimen, a reproduction from Etty's *Cupid and Psyche*, from the steel engraving in the *Art Journal*, nearly rivals, in the delicacy and crispness of its lines, the original, which some of our readers may remember, was engraved by Mr. F. Joubert—a name at one time well known to photographers.

PRESENTATION TO MR. J. A. SPENCER.—On the occasion of the retirement of Mr. J. A. Spencer from the Autotype Company, with which he he has been so long connected, a meeting of the male *employés* at the Autotype Factory, was held in the Green Man Hotel, Ealing Dene, on the 22nd ult., for the purpose of presenting Mr. Spencer with a token of the respect and esteem in which he was held. There were over forty persons present, the chair and vice-chairs being occupied by Messrs. H. G. Burton and L. Hill. The testimonial consisted of a handsome binocular microscope with its appurtenances, and an illuminated address on vellum. Mr. Henry Taylor, who presented the testimonial in the name of one hundred subscribers—all of whom were connected with the factory—spoke of Mr. Spencer as a gentleman he had known and respected for over thirty years. Mr. Snelling testified to the popularity of Mr. Spencer among all the *employés*; and Mr. Foxlee said that such feeling were not confined to themselves, as Mr. Spencer was greatly respected by the public at large. Mr. Spencer responded in a feeling and suitable manner. Such a handsome gift was as unexpected as it was gratifying. The meeting was also made the occasion of their taking a farewell of two others of their number who were leaving—Mr. Skelton, to reside in Scotland, and Mr. W. T. Wilkinson, who was to start that week for Ceylon. Many good wishes were expressed on behalf of these gentlemen, Mr. Burton making special allusion to the active and valuable service that Mr. Wilkinson had rendered to the Photographers' Benevolent Association, of which he was secretary. Music formed a leading element in this happy gathering, Messrs. Alexander Spencer and Snelling presiding at the pianoforte.

METEOROLOGICAL REPORT,

For the Week ending January 3, 1877.

Observations taken at 406, Strand, by J. H. STEWARD, Optician.

THESE OBSERVATIONS ARE TAKEN AT 8 A.M.

Dec.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks
28	29·70	W	54	55	56	44	Dull
29	29·82	W	50	52	55	50	Dull
30	29·61	SW	49	50	55	46	Dull
1877. Jan.							
1	28·78	SW	49	51	54	50	Raining
2	29·67	NE	37	39	56	36	Dull
3	29·57	SE	45	46	—	37	Raining

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 871. Vol. XXIV.—JANUARY 12, 1877.

DENSITY IN RAPID DRY PLATES.—CAPTAIN ABNEY'S DISCOVERY.

We had occasion very recently to notice briefly a suggestion made by Captain Abney, at the last meeting of the Photographic Society of Great Britain, relative to the production of density upon dry films of a highly sensitive, though feeble, character, and are now in a position to give our readers a *résumé* of the results attained in following out the course spoken of by Captain Abney. We speak of that gentleman's communication as a suggestion, because, from the nature of the treatment recommended, we think the method is likely to prove more valuable, from a theoretical point of view, than as a really practical solution of the problem how to secure density without injuring the sensitiveness of the extremely rapid forms of dry plates; and from the manner in which the communication was made we think its author is inclined to be of our opinion. As a theoretical fact it is probably the most important discovery we have had to record for some time—at least in dry-plate work; and its bearing upon the action of light and the process of development can scarcely yet be fairly estimated, though it is certain that many disputed points will be settled if not explained by its means. As regards its practical application, it will rest of course with individuals to decide whether the gain is in proportion to the expenditure of trouble and expense, for it must be confessed that in the last respect a serious objection presents itself; nevertheless we can understand that under peculiar circumstances any objection of this description may be more than over-balanced.

It is not our intention here to enter into any theoretical consideration of the subject, but merely to record our own practical results and the conditions under which they were secured; so we may at once proceed to the point. For the benefit, however, of those of our readers who have not hitherto given the matter their attention, we may give a brief description of the peculiarities of the method proposed by Captain Abney. It is well known to dry-plate workers that in proportion as the sensitiveness of the film is increased the difficulty in obtaining printing density in the negative becomes greater, until we reach a stage at which the films possess the most exalted sensitiveness, but are utterly incapable of forming a dense image. The two qualities, rapidity and density, would appear to be to a certain extent incompatible in the same film, more especially when emulsions are employed; for, although it is a matter of the greatest ease to prepare a film characterised by either extreme rapidity or facility of intensification *singly*, the combinations of the two, by whatever means brought about, are at best but compromises. Captain Abney has stated that in order to overcome this difficulty it is only necessary to employ a film possessing in a high degree the quality of rapidity, and that the power of rendering density is conferred by re-coating, after exposure and just before development, with a slow emulsion possessing density-giving properties, a suitable film being interposed to prevent the solution of the exposed layer.

It is extremely easy of comprehension how a thick or double film of silver bromide should give a denser image than a thin one under similar conditions, but the peculiarity of the above arrangement is that the film which gives the extra density has undergone no exposure to light, and is, therefore, indebted for the change which takes place to the secondary action of the light-impressed under-film. The increased density is produced almost entirely by the independent development of the unexposed film; for, if the two films be separated, which is a comparatively easy operation, each will be found to bear an image possessing the physical appearance peculiar to itself, and it is worthy of remark that the image produced upon the unexposed film is characteristic of the natural density of the emulsion used, while the effect is given of a much higher degree of rapidity than is possessed by the emulsion itself. At present we content ourselves with merely noting the peculiarity without attempting to explain it; doubtless the matter will receive investigation at the hands of others as well as ourselves, the result of which will be placed before our readers in due course.

And, now, as regards the practical application of the method. The requirements are, first, a rapid film incapable of intensification; second, a preservative substance insoluble in ether or alcohol, but permeable to water; and third, an emulsion of bromide of silver, prepared in such a manner as to give a maximum of density, but not necessarily endowed with high sensitiveness. The plate is prepared as usual, the only point requiring special attention being the preservative, which, in addition to the condition mentioned above, must form a sufficiently thick layer when dried to effectually prevent the penetration of the emulsion when poured on. After exposure the plate, in place of being moistened with alcohol, is re-coated with emulsion, and when the latter has set sufficiently the surface is washed until greasiness disappears, and the development carried out in the ordinary manner.

In order to save trouble at a later stage we may here describe our experience in the matter of preservatives, of which we have tried four, namely, gum arabic, dextrine, albumen, and gelatine. It may be stated that where it is necessary for the keeping and other qualities of the plate to employ a substance such as tannin, which is incompatible with and cannot therefore be mixed in the preservative of (say) gelatine, the "organifier" (we will make that distinction between the two) may be applied and allowed to have its action separately, being washed off previous to the application of the preservative proper, or if required to remain in the film it may be mixed with one or other of the preservatives mentioned. We shall have more to say farther on respecting the action of organifiers; at present we shall briefly allude to the mechanical properties of the preservatives. Gum arabic, which we used first, we found to be very subject to blistering; indeed this tendency was so great that we had considerable difficulty in keeping the two films together on the plate. Dextrine exhibited an improvement, but did not altogether remove the defect.

Believing this effect to be due to the solubility of the intermediate film, we endeavoured to replace it by one at least partially soluble. For this purpose we next tried albumen, trusting to the action of the emulsion to produce a partial insolubility. In this respect we were not disappointed, for the blisters were reduced to a minimum; but at times a certain irregularity was observable in the developing action, suggesting the inference that the albumen film interfered in some way with the thorough permeation of the developing solution. The best medium was at last found to be gelatine of the strength of three or four grains to the ounce, applied slightly warm in order to preserve its fluidity; using this preservative the two films adhered perfectly all through the development, while the image came out with rapidity and regularity.

As regards the character of the films operated upon, we imagine it can matter little how they have been prepared—whether with the bath or by means of an emulsion—provided the density-giving emulsion be what it is required to be. With this idea we prepared an emulsion, adopting all the conditions conducive to sensitiveness at the expense of density. The pyroxyline was treated with alcohol in order to remove, as far as possible, the organic principle; it was then dissolved, bromised with cadmium, and sensitised as soon as the collodion had become clear, three grains excess of silver and one minim of nitric acid being used in each ounce. After standing for twenty-four hours to ripen this emulsion worked with great rapidity, giving in the ordinary method of use a thin, delicate image, which it was all but impossible to work up to printing density, even with silver. Plates were prepared, using a plain four-grain solution of gelatine as the preservative, without any organifier.

After exposure the plates were coated with an emulsion prepared according to the old collodio-bromide process, with excess of bromide to the extent of about one grain per ounce, and two drops of sulphuric acid in each three ounces. The result was an emulsion of fair sensitiveness, but much inferior to the one just described, and capable of producing any desired density up to complete opacity with alkaline pyro. alone; this formed the necessary aid for adding density to the thin deposit obtained by means of the rapid emulsion previously described.

After coating with the second emulsion the plate was washed thoroughly and the development performed in the usual manner with alkaline pyro., the only peculiarity being the length of time required to start the operation. When once the image becomes visible, however, it gains strength rapidly and acquires full printing vigour without materially interfering with the sensitiveness or detail of the original film. It might be supposed that the difference in effect arises from some action of the second film upon the first, which modifies the character of the deposit; but a separation of the two films discloses the fact that each carries a picture—that upon the under film being no denser, appreciably, than it would be if developed under ordinary conditions. It is remarkable, however, that the image formed upon the second film is entirely different in character from that given by the same emulsion by itself; for, while less generally dense than it would be under those circumstances, it contains detail which it would require a much longer exposure to produce than was given to the under film.

Owing to the necessity of using a preservative this treatment is obviously inapplicable to washed emulsion plates, or, rather, it is useless to go to the trouble of preparing the washed emulsion if the films require re-washing and preserving after all. Still, with the object of satisfying ourselves that the action is the same, we repeated our experiments on a sample of washed emulsion which is almost useless on account of its deficiency in density, and found that in the main the results are identical; indeed, there can be little doubt of the efficacy of the plan upon all descriptions of plates, whether bath, emulsion, or gelatine.

We made allusion a short distance back to the employment of organifiers as distinguished from preservatives in this connection, but we do not find that such a course is necessary or even advisable. Practically it appears that, as regards rapidity, no gain, but rather the opposite, is secured, while in respect to density the effect of the second film of collodion is quite sufficient. We hold a strong opinion that the use of any substance of an active character is injurious to sensitiveness; hence we imagine it will be found that the greatest degree of rapidity will be attained upon films treated with neutral gelatine alone, though such a film if dependent upon itself alone for density would be utterly useless.

We shall continue our investigations practically as well as with a view to a study of the theory involved in the phenomenon, and we may have to return to the subject at no distant date.

ORNAMENTATION AND BORDERS FOR PHOTOGRAPHS.

It has always been a principle in the conducting of this Journal not to advocate the adoption in the mounting, or even the surroundings, of a photograph of anything having a tendency to distract attention from the primary object—the portrait.

The best and purest photographic portrait is that in which a simple photograph is affixed to a simple mount. By the "chromotype" system, introduced into this country by M. Lambert, the portrait was surrounded by accessories of other than a merely pictorial kind, such as the embellishment of the photograph by announcements in photographic printing that it was the work of a certain artist, whose name and address were prominently emblazoned upon the face of the photograph. As regards the judgment displayed in the introduction of such accessories on the picture side of the mount that is "a matter of taste." We venture to say that a large number of photographers do not approve of such additions. There are others who do. A third section do not quite admire it, but do not wish to be behind the times in their ability to provide for the wants of those who have had their tastes and desires stimulated by the announcement of "a new thing in photography."

To photographers who are impressed with a sense of the necessity or desirability of providing for their *clientèle* "fancy borders, titles, and other devices, or ornamentation on photographic pictures," Mr. Oliver Sarony, of Scarborough, makes an appeal in a patent to the specification of which we are about to direct attention.

By way of introducing this matter we shall recur to the recent exhibition of the Photographic Society of Great Britain, held at the Gallery of the Society of Painters in Water Colours, and venture an observation on a camera which was there exhibited. It was constructed by Mr. P. Meagher, but from subsequent correspondence in this Journal, and from an announcement made by a card upon the camera itself, we are now aware that it was exhibited with the view of showing in what manner certain mechanical details of the Sarony idea, which had been suggested by Mr. E. W. Foxlee, could be efficiently carried out in practice. These improvements, we perceive, have been embodied by Mr. Sarony in his final specification. Whether it be legal or not for a patentee to introduce such new ideas into a final specification we shall not now stop to inquire, but proceed to give an account of the steps adopted by Mr. Sarony for carrying into effect his idea of a successful method of printing upon a portrait the name and address of the photographer by whom it was taken, in addition to such other ornaments, by way of border, &c., as it may please his fancy to introduce.

In his first or provisional specification Mr. Sarony says:—

> "My invention relates to improvements in the production of the fancy borders, titles, and other devices or ornamentation on photographic pictures, and is chiefly designed for use in carbon printing, although it is equally well adapted for salts of silver pictures, the object of the invention being to obtain the title, tint, or fancy border on the negative so as to dispense with the aid of the registering presses or registering tinting presses hitherto employed, and the second printing for producing the title or border on the positive picture, so that a portrait having the appearance of what is known as a chromotype may be produced in one printing instead of two, as at present.
>
> "According to my invention I attach to the plate-holder a slide mounted close in front of the sensitive plate, said slide being provided with two openings. One of these openings is of oval or other form corresponding in size to that of the picture desired, the other opening being of sufficient size to include both the picture and border of the photograph when finished. In this latter opening a piece of colourless glass or other suitable transparent material is inserted, on which is printed—by lithography or otherwise—in vitrified colours, which are burnt in, the title, fancy border, and a mask to correspond exactly in size and shape to the first opening.
>
> "In operating according to this invention I fix the slide to register at the oval or other shaped opening first mentioned opposite the lens, and after focussing expose in the ordinary way through such opening. I then place the cap on the lens and traverse the slide to register at the other opening containing the glass with the mask, and replace the cap by one made by a covering of ground glass and a second covering of tissue paper arranged a short distance in front of the glass. I then expose for a few seconds (the mask protecting the object already produced), and in this manner produce the border or title on the negative. By this means uniformity of printing is ensured, and the portrait may be produced in one printing from the negative and in the ordinary printing-frame."

In the completed specification Mr. Sarony takes somewhat wider and more comprehensive ground, as will be seen from the following:—

"My invention relates to improvements in the production of fancy borders, titles, and other devices or ornamentation beneath or around photographic pictures. It is chiefly designed for use in carbon printing, although equally well adapted for salts of silver pictures. The object of the invention is to obtain by two successive exposures through two different openings, as hereafter described, the title, tint, or fancy border on the same negative with the picture, so as to dispense with the use of registering presses and registering tinting presses hitherto employed, and therefore with the second printing for producing the title or border on the positive, so that a print having the appearance of what is known as a chromotype may be produced in the ordinary printing-frame at one printing instead of two, as at present.

"For the purposes of my invention the two openings through which the two parts of the plate are successively exposed, as hereafter described, may be contained in a sliding frame fitted to the plate-holder and close in front of the sentised plate, or they may be contained in separate frames hinged or pivoted within the camera. In either case the plate-holder may be arranged for one, two, or more portraits on the same plate.

"I will describe the openings as used for a single portrait on the plate. The one opening is of a form and size to correspond exactly to the style and dimensions of the picture desired, or, if larger, is fitted with a piece of glass or other translucent substance having a mask with a clear part or opening in the middle of the style and dimensions of the desired picture, so that the part of the plate which will be occupied by the border is masked. The other opening is of sufficient size to include both the picture and the border, and in it is fixed a plate of colourless glass or other suitable transparent material, upon which is fixed a mask corresponding exactly in size and shape to the first opening, and in such position that when the second opening is made to occupy the place of the first in front of the sensitised plate the said mask will exactly coincide with and protect the part previously exposed through the first opening. The plate in this second opening has also printed or otherwise produced upon the clear portion (by photography, or by lithography, or otherwise, in vitrified colours, which are burnt in) the title, fancy border, or other device it is desired to produce beneath or around the picture.

"In operating I first bring the first-mentioned opening in front of the sensitised plate, and having focussed I expose in the ordinary way through such opening to take the portrait. I then cap the lens and close the dark slide, and having caused the second opening to take the place of the first I proceed to expose the border. This second exposure is performed with the aid of a cap specially constructed to equalise the light and shut out exterior objects, and consisting of a tube with an outer covering of tissue paper at one end and a piece of ground glass placed a short distance behind the paper within the tube. Having replaced the ordinary cap by this special cap I expose the second time for a few seconds to light admitted through this cap, and in this manner I produce the border and title on the negative, the mask in the second opening protecting the picture already produced.

"If the two openings be contained in a sliding frame, and more than one portrait is required on one plate, I employ the usual 'slide back' camera, the sliding frame being fitted in a groove on the plate-holder. When the two openings with their plates and masks are contained in separate frames these are hinged or pivoted within the camera near either side thereof (in much the same way that the well-known dark shutter is pivoted), so as to be capable of folding back out of the way against the sides of the camera, or of being brought one at a time close against the sensitised plate, in the plate-holder.

"In order that the frames may be as close as possible to and parallel with the sensitised plate they are attached to their pivots by curved arms, and they are provided with small stops to prevent them actually touching the plate. The pivots of the frames are prolonged through the top of the camera and provided with milled heads, by which the frames may be turned back against the sides of the camera or against the sensitised plate. The apertures in these frames are fitted with plates bearing masks and the devices to be reproduced on the negative precisely like those in the slide above described. I first bring the one frame in front of the sensitised plate and expose, then cap the lens and turn back the first frame, and bring the second one in front of the plate, and expose again to light admitted through the special cap as in the former case."

The special claim made by Mr. Sarony is thus described in the specification:—

"1. The production, as herein described, of fancy borders, titles, and other devices or ornamentation on the same negative with the picture by successively exposing different parts of the plate through different openings, constructed and fitted as herein described.

"2. The use of the semi-transparent cap in producing the border, title, or other device on the negative, as and for the purpose herein described."

The popular taste as it at present prevails does not appear to be in favour of photographs in which the system of masking and printing of names here indicated is adopted. The arrangement, however, in which a hinged mask is used, as described in our number for September 29th, 1876, page 459, and which we may, from the light since thrown upon the invention, be inclined to designate the "Tilley-Foxlee-Meagher-Sarony" system, will prove to be by far the best of those either described in the specification of the patent or introduced at a previous date.

◆

EDINBURGH PHOTOGRAPHIC SOCIETY'S EXHIBITION.

The medals offered by the Edinburgh Photographic Society have at length been awarded, and if ever such awards may be expected to be really popular we think they should be so in the present case. The Committee have been singularly fortunate in their Judges, comprising the following gentlemen:—Sir Daniel Macnee, P.R.S.A.; Norman Macbeth, A.R.S.A.; John Lessels, Architect; Thomas Annan, Photographer, Glasgow; Thomas Rodger, Photographer, St. Andrews. We believe the report which follows will meet with as much favour universally as it has done locally:—

Report of the Judges Appointed by the Exhibition Committee to Award the Medals Offered for Competition at the Photographic Exhibition in the Royal Academy National Galleries in 1876-7.

Your Judges, having examined the pictures sent for competition, are unanimous in deciding on the following awards:—

1. The gold medal for "the picture which possesses the highest degree of merit, irrespective of size or subject" to A. Kareline, Nijnii-Novgorod, Russia, for his picture No. 775. *Characteristics:* invention applied to figure subjects, under skilful arrangement of light.

2. A silver medal for the best landscape of 8½ × 6½ or under to Mr. Wm. England, 7, St. James's-square, Notting-hill, London, for his picture *The Wetterhorn* (No. 768), from a dry plate. *Characteristics:* fine aërial perspective, with both foreground and extreme distance in good keeping.

A bronze medal for the second best picture of the same class to Mr. H. A. H. Daniel, 49, Bread-street, Bristol, for *On the Froom*, (No. 724). *Characteristics:* good choice of subject, and vigorous treatment.

3. A silver medal for the best landscape above 8½ × 6½ to Mr. Payne Jennings, Belgrave-place, Rathmines, Dublin, for number four of his frame *Picturesque England and Ireland* (No. 233). *Characteristics:* singularly clear in definition, perfect aërial perspective, and strongly-expressed foreground, combined with much delicacy.

A bronze medal for the second best landscape of this class to Mr. George Wardley, St. Ann's-square, Manchester, for his picture of *Aberglaslyn, near Beddgellert* (No. 152), from a collodio-albumen plate. *Characteristics:* all the works of this photographer are worthy of attention in respect to treatment of his subject, and particularly fine in mid-distance.

4. A silver medal for the best portrait from 8½ × 6½ to 15 × 12 to Mr. J. M. Young, Llandudno, for his picture of *Hide and Seek* (457). *Characteristics:* although this work is entitled *Hide and Seek* and a *Study*, your Judges cannot but recognise it as a portrait, and one possessing very much the qualities of the work of Sir Thomas Lawrence; the expression of the eyes is beautifully sustained.

A bronze medal for the second best portrait of this class to Mr. James Howie, Jun., Princes-street, Edinburgh, for his *Portrait of a Gentlemam* (No. 266). *Characteristics:* this work does not embrace much treatment, but your Judges regard it as a specimen of very true rendering without the aid of *modelling* the negative, and thus preserving the natural texture and lines of the face.

5. A silver medal for the best portrait above 15 × 12 to Mr. Marshall Wane, of Douglas, Isle of Man, for his portrait of *Mdlle. Carlotta Le Clercq* (No. 225). *Characteristics:* fine arrangement of the figure, and perfect rendering of the texture in the different fabrics.

A bronze medal for the second best picture of this class to Mr. J. M. Young, Llandudno, for his *Study of White Drapery* (56). *Characteristics:* portraiture treated pictorially, and great regard to sustaining the colour and tone of white drapery without chalkiness.

6. A silver medal for the best landscape by an amateur to Mr. Robert Crawshay, Cyfarthfa Castle, Merthyr Tydvil, for his picture, *Boat Pool, River Usk* (No. 52). *Characteristics:* great refinement in quality, with sky in beautiful harmony.

A bronze medal for the second best picture of this class to Mr. John Parker, 116, St. Vincent-street, Glasgow, for his picture of *Polmadie House* (No. 75). *Characteristics:* very rich in quality, chiefly produced by side-lights, and consequently bringing in much breadth of effect.

7. A silver medal for the best *genre* picture to Mr. H. P. Robinson, Tunbridge Wells, for his picture, *His Own Fireside* (No. 544).

Characteristics: many of the works by this gentleman are highly meritorious through the skill displayed in combining separate negatives in order to make one picture; but this work has the appearance of being simpler in its contrivance, and tells very directly its own story.

A bronze medal for the second best *genre* picture to Mr. George Nesbitt, Bournemouth, for his picture, *On Guard* (No. 415). *Characteristics:* this gentleman is very prolific in his art; and, although his backgrounds are somewhat faulty, he succeeds well in uniting his subject.

8. A silver medal for the best combination picture to Mr. Adam Diston, Leven, Fife, for his picture, *The Broken Toe* (No. 547). *Characteristics:* this gentleman is singularly successful with a method of combining several figures on one plate by the superimposing of various films, one after another, till the picture is complete. Your Judges understand that this method was first introduced by Mr. Johnston, of Wick, a specimen of whose work is to be seen in No. 356, wherein both sky and sea are united.

A bronze medal for the second best picture in the same class to Mr. Samuel Fry, Kingston-on-Thames, for his picture, *The Taxidermist* (No. 513). *Characteristics:* very much elaborated, chiefly created by the subject. The quality throughout is very perfect and worthy of the closest inspection.

9. A silver medal for the best single figure study to Mr. R. Faulkner, Kensington-gardens, London, for his *Studies of Expression* (No. 627). *Characteristics:* very original in style and surpassingly beautiful in expression. Altogether this artist is completely at home in photographing children.

A bronze medal for the second best picture in this class to Messrs. Taeschler Brothers, St. Fiden, Switzerland, for their *Studies* (No. 13). *Characteristics:* very careful study of arrangement in all the work, and the sentiment and expression of feeling in the children exquisite. The general arrangements of the ladies' portraits are finely elaborated in combination with both natural and artificial backgrounds.

10. A silver medal for the best reproduction from painting in oil or water colour to the Berlin Photographic Company, for the picture, *The Angels*, by Raphael (No. 706).

A bronze medal for the second best picture in the same class to Mr. John Pouncy, Dorchester, for his reproductions on wood and canvas (Nos. 719, 720, and 726).

11. A silver medal to the Autotype Company, London, for general excellence in the enlargements exhibited by them.

Your Judges, in connection with the last award, desire to state that, although the process of enlarging is fully represented, there are comparatively few specimens which are actually the work of the exhibitor, and they have, in consequence, resolved to take the responsibility of slightly varying the conditions on which the medal was offered, and award it as they have done.

A bronze medal for the second best enlargement to Mr. Benjamin Wyles, Southport, for his portrait of *Miss Braddon* (No. 834). *Characteristics:* not unlike Sir Joshua Reynolds in breadth and simple treatment.

12. A silver medal for the best photo-mechanical print to Messrs. Goupil and Co., London, for their reproduction of the picture, *Reconnoitring* (No. 681).

A bronze medal for the second best reproduction to Mr. B. J. Edwards, London, for his portraits (No. 603).

13. A silver medal for the best enamel to Herr Geldmacher, Frankfort-on-Maine.

A bronze medal for the second best enamel to Mr. W. T. Watson, of Hull.

15. A silver medal for the best photograph by an amateur, who is also a member of the Edinburgh Photographic Society, to Mr. Geo. A. Panton, Edinburgh, for his picture, *Maiden Bridge* (No. 270). *Characteristics:* composition very good—clear, yet full of atmosphere, and equal to the work of some of the best professional landscapists.

A bronze medal to Mr. R. G. Muir, Edinburgh, for the same subject (No. 105). *Characteristics:* the two frames shown by Mr. Muir contain several fine bits of natural scenery. The *Bridge* is exceedingly beautiful in quality owing to a full development of light.

In addition to the awards provided for in the prospectus of the exhibition there are several classes of exhibits not included, to which your Judges would respectfully direct attention.

They would recommend that a special silver medal be given to Mr. Frederick Hollyer, of Pembroke-square, London, for his *Studies of Rustic Subjects*, of which No. 473 is an example. His aim in this department has evidently been to make provision for pictorial purposes, to meet the wants of many artists in that walk, and in this respect he has been successful.

Your Judges are also of opinion that a special medal should be awarded to Mr. J. Ganz, of Brussels, for his transparencies both for decorative and educational purposes. His lantern pictures, including physiological, botanical, and mechanical specimens, are simply perfect.

Your Judges think it right to say that in all classes of exhibits they had, in many cases, much difficulty in arriving at a decision. There were so many pictures of nearly equal merit that it was often a matter of extreme difficulty to make the necessary award; and many of the pictures that were marked "not for competition" are of the highest excellence.

Your Judges have examined several frames of portraits in which very beautiful effects are produced by modelling and retouching; such, for example, as those by Mr. Gutekunst, of Philadelphia (No. 501), and Herr Kosmata, of Budapeston (No. 636); and, although the results are undoubtedly very pretty, they consider it would be unfair to place them in competition with pictures printed from the original and comparatively untouched negatives.

(Signed) Daniel Macnee, Kt., P.R.S.A.
Norman Macbeth, A.R.S.A.
Thomas Annan.
Thomas Rodger.
John Lessels.

RETICULATION IN CARBON PRINTS.

Those who listened to the discussion on carbon printing, on Tuesday evening last, at the meeting of the Photographic Society of Great Britain, are aware of the prominence given to the subject of the reticulation of the film. We allude to this at present for the purpose of introducing some important practical remarks made on this subject in our Almanac for the present year by Mr. E. W. Foxlee, and we give them *in extenso*, with the addition of some further observations made by Mr. Foxlee, but which were received too late for insertion in their place in the Almanac as intended. These throw still further light upon this interesting subject, and are as follow:—

"*Reticulation, or the Picture Covered with Fine Network.*—This evil has caused much trouble to carbon printers during the past hot summer, and has generally been attributed to bad tissue (the poor tissue and its manufacturers!); and I may here say that this defect puzzled me more than any other matter connected with carbon printing, until I found the cause and remedy, which, as I expected, is an exceedingly simple affair, and depends entirely upon the manner in which the tissue is dried. If it be dried quickly—say in three or four hours—a fine specimen of this defect may generally be depended upon; hence its prevalence in hot weather. If, on the contrary, it be dried slowly—say in nine or twelve hours—then the same tissue will be perfectly free from this defect. I may here add that in my opinion the drying of the tissue is the only part of carbon printing that requires any real judgment; for if this be properly managed all the other operations are simplicity itself.

"I would strongly recommend every carbon printer to invest a few shillings in a wet and dry bulb thermometer (if he do not already possess one), and keep it in the apartment he dries his tissue in. By consulting it he will see how to avoid all the evils inherent in the drying of tissue. Thus, if he see as much as 10° or 12° between the wet and dry bulb he may rely on having as fine a specimen of reticulation as that sample of tissue is capable of giving, so that the atmosphere must, of course, be damped, either by watering the floor or other means. If, on the contrary, the two bulbs show a difference of only 1° or 2°, then will the tissue take so long to dry that there is little doubt it will be insoluble. In this case the atmosphere must be dried, either by ventilating the room or lighting a small fire in the stove, bearing in mind that the object of the fire is to *dry* and not to *heat* the room. It may be asked:—'What is the difference between the two bulbs that is most suitable for the purpose.' This I have not yet decided *absolutely*, but if a difference of 5° or 6° be kept it will be found to suit most tissues."

There can be no doubt that it is inattention to such apparently unimportant details in the manipulation of carbon printing which has tended more than anything else to hinder its almost general adoption, for those who do take the trouble to master it speak of the process in terms which must make it plain that there is no more trouble or uncertainty, if indeed as much, connected with carbon printing than with silver.

◆

Nearly a year ago sulphuric acid was recommended by Colonel Stuart Wortley as an addition to the collodion emulsion for the purpose of conferring density, and we have now to propose its use with a different object, namely, the improvement or modification of the character of the film. It frequently happens that, owing to the nature of the pyroxyline or to accidental circumstances, the dried film is so rotten or tender as to be liable to damage from the slightest cause, while its photographic properties suffer equally from this abnormal state of affairs. We agree with the generally-accepted dictum that a patched-up article is never equal to one which requires no patching; but circumstances often arise when that objectionable course is the only alternative. Where a faulty collodion is in question some advantage may frequently be derived from a recourse to the parchmentising action of sulphuric acid upon the cotton, as first noticed many years ago by Mr. Hardwich. Nitric and hydrochloric acids when added to collodion are generally supposed to exercise a rotting effect upon it, though this is denied by many; but the effect of sulphuric acid is quite the opposite, and if used in too large a proportion the collodion becomes so "horny" as to be entirely useless. By regulating the quantity of acid to suit the requirements of the particular sample of collodion a very great improvement may be effected. For instance: a thin, fluid collodion made from high-temperature cotton, and giving an extremely powdery film, has been treated by us with sulphuric acid and transformed into a tough transfer collodion. The action appears to offer a means of preventing or, at least, mitigating the destruction of the pyroxyline during the operation of washing an emulsion. We have tested it with a sample of pyroxyline with which we have hitherto failed in securing a satisfactory result, and find upon re-solution that the film is strong and of good body, and quite free from the poor, thin characteristics previously exhibited by the same cotton. The action thus produced is entirely distinct from that performed by the acids used during or previous to sensitising.

PHOTOCHROMY.

THIS subject seems to have gained some prominence lately, an impetus having doubtless been given to it by the new method of colour printing of M. Otto Radde, of Hamburg.

As I have carefully watched the matter for many years, some notes on the subject may help the history of what will, in time, I have no doubt, form an important branch of our art.

To begin: I shall have to go back a very long way—in fact, as far as the year 1860—before paper printing had asserted its sway, and when the glass picture was in vogue. At this time I (and others, for what I know) employed the following system:—The positive was taken with an even, darkish background and whitened with mercury, &c. The figure, foreground, and accessories were carefully blackened at the back, leaving only the background transparent. Behind this was placed a small chromolithograph, representing some mountain or other landscape, the deposit on the background, by careful management, toning down the crude colours of the lithograph, so that they harmonised with the powder colours used to colour the positive. By judicious management some really artistic effects were produced in this manner. This, I think, may be considered as the first combination of photography with chromolithography.

My next connection with the subject began during the year 1865, when I was engaged working out the process bearing my name. At that time, owing to the great difficulties I found in getting a sufficiently fine surface on paper to receive the relief impression, my trial proofs were generally made on plate glass, and backed with white paper. These, lying about in all sorts of places and on all sorts of coloured materials, suggested the utilising of their remarkable transparence by placing coloured media at the back, where even the deepest shades in the picture were in a sense transparent. To illustrate my meaning: let any one throw a Woodbury transparency on the screen, and then spread out the fingers within a few inches of the reproduction. He will be astonished to find that what appeared to be a deep black was a light brown by comparison with the hand's shadow.

A few roughly-tinted backgrounds were next tried, and I was then fully convinced that a combination of these processes might some day be effected; but, also, that before going so far I had a great deal of work before me to arrive at perfection in one tint before going into several. I did not want to run before I could walk. I may here refer, by the way, to M. Vidal's article in the last number of THE BRITISH JOURNAL OF PHOTOGRAPHY, in which he says that the late Mr. Sutton communicated to him, as *far back* as December, 1873, an idea of applying colours to the back of a carbon print. Mr. Sutton was evidently then just eight years—an age in photographic invention—behind the times.

To go back to my history: in the year following (1866) a gentleman who at that time became associated with me thought the colouring at the back worthy of a patent; and, although I was not of that opinion (knowing that such methods had already been used), he persisted in entering the method. During the latter part of 1866 and early in 1867 a number of experiments were tried; but from that date, owing to practical difficulties, the method was virtually abandoned.

About three years ago, having spare time to give to the matter, I commenced a series of experiments in another direction, the result being a practical and certain method of doing what had hitherto been comparatively a failure. But even then matters did not advance with any greater rapidity. I tried to interest several chromolithographers in the matter; but all I found was that each experiment would cost me some £10 or more to have the multicoloured under-prints made, and not having a number of £10's at my disposal caused a fresh abandonment.

In the early part of 1875 M. Otto Radde called on me with the view of adapting his method to my requirements. This was just the opportunity I had long wanted—some one who, on his side, was equally interested with myself in the matter. The result was the little picture of the *Devonshire Cottage* which was exhibited at the South London Photographic Society at the close of the same year. Absence from home during the greater part of last year prevented much advance; but, as the subject is now having my fullest attention, I trust that by the end of this year the method will be so far advanced that through the medium of this Journal photographers will have an opportunity of judging of the effect of the combination of stenochromy with Woodburytype. W. B. WOODBURY.

P.S.—In hunting up old dates on the above subject from my diaries I came across the following, which bears on another subject lately talked of as a novelty in the journals. Subsequent experience led me to abandon any idea of its future use:—"*March* 30*th*, 1866.—Idea for using agar agar in photography in place of gelatine. Write to Java for some."—W. B. W.

A NEW DEVELOPER FOR DRY PLATES—HYDROSULPHITE OF SODA.

THE chief advantages of this developer are—1. Shortening of exposure. 2. Freedom from objectionable smell of the alkaline developer, with better keeping qualities. 3. Freedom from fog during a prolonged development, giving thus a very great latitude in the time of exposure.

If bisulphite of soda ($NaO\ HO2\ SO^2$) be placed in contact with metallic zinc a new substance is generated, viz., hydrosulphite of soda, with great reducing properties, which has been made use of by its discoverer, Dr. Schützenberger, in the dyeing trade, for the transformation of blue indigo into white indigo, which is soluble in an alkali. I will not enter into the theory of the preparation and uses of this substance, but only state its use in photography.

Prepare (A) a solution of forty per cent. of bisulphite of soda;
(B) a solution of twenty per cent. of pyrogallic acid
(the first in water, the second in alcohol);
(C) a four-ounce bottle containing granulated zinc.

When wanted, pour solution A into the bottle C, the liquid filling up the interstices of the granulated zinc. Twenty minutes afterwards the reaction is complete. This solution keeps twenty-four hours only, for the absorption of the atmospheric oxygen gives an inverse reaction. The plate is wetted with water. Then put into a dish containing—

Water	50 parts.
Solution of hydrosulphite of soda	50 ,,
Pyrogallic acid solution	4 ,,

In this the plate remains till completely finished with full printing density and every detail well out.

The time required for the development ranges from fifteen to seventy minutes. The exposure is considerably shorter than with the ordinary alkaline developer, but not quite so short as with Wortley's strong alkaline developer.

As soon as the hydrosulphite is mixed with pyrogallic acid the solution assumes a rosy tinge, but does not darken for at least eight hours, retaining all its developing properties, and this without fogging the shadows of the negative; so that detail may be "coaxed" out of an under-exposed negative without fear of a black veil covering the whole plate.

Collodion as well as gelatine dry plates may be developed by the hydrosulphite solution. L. O. SAMMANN, C.E.

LIGHT, EXPOSURE, AND DEVELOPMENT.

[A communication to the Bristol and West of England Amateur Photographic Association.]

The subjects which I have chosen for my paper are perhaps those demanding the strictest attention of every photographer aiming at work of the highest and most artistic class. To those who are content with what the apparatus and chemicals will produce almost independently of themselves this paper would prove most uninteresting, superfluous, and, in short, not worth wasting time over; but I am happy in feeling perfectly assured that to such I have not the remotest chance of addressing myself this evening. I have done my best to bring together in a modest way certain results and facts that have come under my notice, but it were unreasonable for me to hope that *all*, or even the greater part, of them would be new to you; I therefore ask your forbearance with me should I revert to matters with which many may be already familiar, although here and there they may perchance be fresh.

I have divided my paper into three subjects, the first of which is—

Light.

Of this we know there are two kinds, viz., natural and artificial, the former being composed of seven primary colours, which may be classed as follows—actinic and non-actinic. Artificial light may be produced in a large number of different ways, of one or two only of which I shall speak presently. One of the most evident effects of light is its power of changing the colour and nature of substances which come under its influence—glass, wood, vegetation, chemicals—in fact, almost every substance is more or less affected by it.

The first substance I mentioned—glass—is wonderfully changed by its action, although it may be a long time before we notice it. Some time since I saw certain fixtures removed from the surface of some plate glass, to which they had been affixed for a very considerable period—some years. It was then very manifest to what an extent the colour of the exposed parts of the glass had been changed, and by "changed" I mean darkened. If after some years those letters we often see upon the glass of shop windows be removed, very often a most perceptible difference is apparent. The knowledge of this fact is of great importance to photographers, and should act as a forcible caution to them to expose their lenses to the action of light as little as possible; in fact, not at all beyond what is necessary during absolute work.

But while on the topic of lenses I would just remark that because a lens may *look* yellow and discoloured it does not follow that it *is* so. Very often the cementing balsam in lens combinations will be rapidly acted on by light, being turned to a yellow tint, and making the lens appear discoloured when it really is not.

We often find in the practice of photography that in a very dark and badly-lighted situation there is an object very worthy of the camera; but a photographer should never settle down under the idea that to get a picture is impossible on account of the want of light. If there be any at all near there is hope. It is surprising what can and has been done by the aid of mirrors. The well-known Dr. Vogel actually photographed some of the very remarkable interiors of the Egyptian sepulchres in this manner. They were approached by subterranean passages. At the outer end of one of these a large mirror received the sun's rays on to the mirror at the inner end, which in its turn reflected them again on to the subject. The exposures were, of course, long; but the end was by these means successfully attained.

There is one great point in the matter of light about which we are often liable to be deceived. It is the great variety in the intensity and actinism of light at different times and seasons. The blue colour of the sky proceeds from the fact that the particles of air reflect blue light, the quantity varying with the hour of the day, and being strongest when the sun is highest, and diminishing as the sun sinks. Therefore there is more actinism during the middle of the day—that is, between eleven and twelve. The power of light varies very greatly at different seasons. Thus, at Berlin, Bunsen found that, expressed in degrees, the chemical power of light varied as follows:—

	12	1	2	3	4	5	6	7	8	o'clock.
June 20	35	38	38	37	35	35	24	14	6	degrees.
December 21	20	18	15	9	0	..	..	..	..	„

Thus we see that in winter the chemical power of light is exceedingly weak. We may also be much deceived by great brightness in the light. It does not always follow that a bright day is a chemically light day; for instance, very easily may we be deceived on a bright sunny day in February or March. These are points which, if carefully noted and considered always, would save many a negative from being under-exposed.

As a last remark on natural light I would mention its remarkable power in rendering certain substances insoluble; for instance, the gelatine as prepared for the mechanical printing processes. We all know how the negative is placed over the pigment paper and where the shadows are, and how the gelatine, having been acted on by the light, is rendered insoluble. *Apropos* of this I will just relate a circumstance in the German campaign of 1870.

In the campaign of 1870 the well-known pea-sausage was one of the most important articles of food for the army, and was prepared daily by thousands. The fabrication of the interior portion caused little trouble, but the obtaining of so many skins created much difficulty. As the supply fell short a substitute was sought in vegetable parchment. This paper, which is produced by dipping blotting-paper into sulphuric acid for about a second, then washing and drying, is distinguished by its skin-like properties of resistance. It is impenetrable to water and difficult to tear. It is, therefore, used for the production of bank notes. It was attempted to make sausage skins of this paper by doubling a sheet cylindrically and pasting it together. No glue or gum can, however, resist the effect of the boiling water in which the sausage has to be cooked, and so the artificial sausage skin fell asunder. Dr. Jacobson solved the problem by producing an adhesive substance, with the help of the chemical action of light, which could resist boiling water. He mixed the glue intended for the sausage skin with bichromate of potash, and exposed the glued parts to the light. This made the glue insoluble, and the artificial skin endured boiling water thoroughly well. The number of sausage skins prepared in this way by the chemical action of light amounted to many hundred thousands.

And now as to artificial light. I will simply speak of one or two kinds. Firstly, the magnesium light used by the aid of Solomon's reflecting clockwork lamp—a capital light for enlarging negatives. The electric light is very brilliant and most useful for lighthouses, but not so suitable for photography as the lime light. I have used the first of these, namely, the magnesium light, as very many others have, doubtless, far more than I have, and I have found it most useful. There are many other useful chemical lights very suitable as aids to photography, the formulæ for which I presume all present have seen given in different journals and books. For transparencies at night a very effective and actinic light will be found by using petroline with a large proportion of solid paraffine dissolved in it. I have with its use successfully printed transparencies in five seconds. But light is a wide subject, and if we were to do only a little towards exhausting it to-morrow morning would still find us occupying this room, so I will now pass on to the next subject, namely—

Exposure.

This is a branch of photography most important, and without correctness in which all our attempts at good pictures and artistic productions are useless. I will divide this section under two heads, "When to expose" and "How to expose."

When to Expose.—In taking pictures we may expose correctly, but unless we expose at the right time we are still not making *every* endeavour to obtain first-class pictures; and, unless high-class work be every photographer's end in view, he must expect to see many pass him in the rush for pre-eminence in the art. In the matter of views the time for exposure, of course, depends upon existing circumstances.

First and foremost, one of the matters of chief importance is the position with relation to the view in which the photographer places his camera; or, in other words, the selection and composition of the subject. You suddenly come upon a pretty bit of scenery, either near or distant, which strikes you as admirably suited for the camera. You have only then to look at it from some different points of view to have at once forcibly demonstrated to you what I mean. There is not one single object to which this does not apply—not even, we will say, a pig. A full view of two hams and a curly tail would certainly not be the most becoming that could be selected; there is a proper side even to bacon. How often do we see a gentleman's house converted into a rectangular elevation with sundry excrescences, instead of a range of buildings with lines pleasing to the eye—pretty grounds in front leading one's eye by easy stages to it, instead of a hard-looking house, the front almost flattening one's nose with its eagerness to at once let you know that the picture was taken for its sake.

A photograph is on the table which a gentleman in the city kindly lent me this afternoon; it was taken by a professional gentleman in Devonshire. He was asked to photograph the house in the distance as it appeared from the railway. You will notice that he has given a remarkably fine view of the rails, the roof of the intended principal object being only just visible. It will be generally conducive to artistic effect to get some agreeable object in the foreground, such as a tree, log of timber, rustic seat, and different objects at various distances, all of which will impart a far greater degree of perspective to the picture than it would otherwise have.

I also consider the position of the sun as regards the subject of great importance. No rule can be laid down, but the photographer must use his own judgment as to the position of the sun that will produce a good picture. It may be almost invariably accepted that the sun should not be in the same position as the photographer; that is to say, with its rays parallel with the lens and camera. In landscapes a side light is, as a rule, to be chosen, with modifications according to circumstances. In the case of a river with trees on both sides, the chief care is to expose when the sun is in such a position that any very dark patches in the foliage do not exist, or at least not inharmoniously; also, that the shadows from the trees of one bank of the river do not darken the foliage of the other bank to such an extent as to rob it of its pleasingly-clear definition. Clear definition must not be confounded with hard effects; most beautifully soft and yet clear definition with atmospheric effect may, and should be, obtained without any tendency to hardness. In the majority of cases it may be taken as positive that foliage is better rendered without the aid of the direct rays of the sun; in cases where water forms part of the picture it is *almost* always so. But very often very fine and most desirable effects may be produced by dividing the exposure, giving one part while the sun is shining and another with diffused light. I exhibit a picture marked No. 1, which was exposed in the manner I have stated. We generally find that the lighted or partly-lighted side of a landscape is taken, and of course in a large number of instances it is a most suitable proceeding; but there are sometimes most beautiful exceptions to that mode of procedure. A view of the Dee, in North Wales, No. 2 on the table, you will notice is taken with the shaded side of the picture toward the camera, and I think you will admit that the effect is pleasing. But this, like many other features in photography, cannot be learnt, as can a process; it requires a true artistic feeling in the photographer, strengthened by experience. H. A. H. Daniel.

(To be concluded in our next.)

INTERNATIONAL PHOTOGRAPHIC EXHIBITION AT EDINBURGH.

To those who take an interest in the progress of photography the exhibition now open in the spacious galleries of the Royal Scottish Academy must offer a treat of no ordinary kind.

With becoming modesty the Edinburgh Photographic Society anticipated that a highly-interesting and respectable exhibition, occupying part of the *suite* of rooms above mentioned, might be established. It is, however, pleasing to know that the whole range is not only entirely filled, but that had space been available many more works could have been exhibited.

The application to photographers of all countries to send works here has thus been nobly answered, and it is safe to affirm that a collection such as this has never been previously brought together in any part of the world—in fact, it is purely of an international character; and now that photography has found a voice among the nations, a first-rate opportunity is here presented of judging of the progress that has been made in this really fine art.

It would, perhaps, be out of place here to enlarge upon the influence that photography has exercised upon art and science—on its suggestiveness to painters of every class of subject, especially to the knowing ones, let me say; its valuable assistance to astronomers, as evinced by the recent transit of Venus; its services in jurisprudence and the detection of imposture; and the ever-expanding influence it is exercising in the amenities of social life. In the delineation of the "human face divine" it can hardly be over-rated. In many a lowly and love-lit home, which the painter's art could never reach, are treasured the familiar traits of loved and lost ones—the sunny smiles of parents and children, relatives and friends.

In turning into the north octagon the greater part of the display bursts upon the vision, and one feels that the greatest credit is due to the hanging committee for the harmonious manner in which the works on every hand have been arranged.

The local contributors bulk very largely, and in the very forefront we find the names of the late D. O. Hill, R.S.A., E. W. Dallas, W. Neilson, Ross and Pringle, J. Moffat, J. Howie, Jun., Alex. Asher, and a host of others worthy of all commendation.

Among the works sent by Messrs. Ross and Pringle perhaps the most notable is the whole-length, in carbon, of *Mrs. Murray, of Philliphaugh.* Stately and elegant in person and deportment, in this lady they have found an excellent subject. Broad and masterly in light and shadow, and rich in tone, this work must attract considerable attention. No. 493 is an excellent portrait of our esteemed member of Parliament, *Duncan McLaren,* and in No. 503 a very fine head of *Sir John Steell, R.S.A.*—both in carbon. I must likewise mention a forcible head of *Sir J. Noel Paton, R.S.A., LL.D.,* and No. 881, portrait of the late *Alexander Russell,* editor of the *Scotsman*—a work which will be appreciated by all who knew him. There are also from Messrs. Ross and Pringle portraits of the *Earl and Countess of Galloway, The Misses Grant Suttie, Kenneth MacLeay, R.S.A.,* and a very fine portrait of *Master Jeffrey.* To those who delight in children, No. 950, *Fairy Rings,* must prove a work of special attraction. Here we have a cluster of pretty children, each embowered in tangled evergreens, and all nicely tinted in water-colours. As this work is beautiful, may it be lasting!

> "Pity it were, if time should ere efface
> These radiant blossoms; cull'd from the golden sheen
> Of love's imperial bowers."

Did time and space permit Messrs. Ross and Pringle's portraits in oil of several local celebrities might be much commended. Among them I find the names of the late Sheriff Jameson, Dr. Matthews Duncan, the late George Dalziel, Esq., and the Rev. George Phillip; also The Countess of Caithness; and No. 914, a very capital *genre* picture entitled *Punch.*

Among the most notable contributions of Mr. William Neilson—which, by the way, are in general *not* retouched—will be found in No. 150, portrait of *James Henderson,* taken direct, an admirable likeness and a most complete photographic production. The tone and texture, breadth of light and shadow, are finely kept together. The excellence of this work proves how fatal retouching is unless when most skilfully done. In No. 429, portrait taken direct, and No. 396, portrait of *John Hume, Esq., W.S.,* is also seen clearly the merit of unretouched workmanship. The heads in these instances round themselves out strongly from backgrounds of considerable depth, and are exceedingly effective. Nos. 474 and 475 are also most noteworthy. In No. 554 are embraced six portraits, direct and untouched. In this group must be noticed the very fine portrait of the old gentleman at the top—so full of character, and possessing all, in fact, that the art may attain. No. 542, *Thrying his Riverince's Sate,* is a very humorous *genre* subject treated with much skill—Pat's genuine Hibernian expression and tatterdemalion appearance contrasting most ludicrously with his very elegant surroundings.

I have now to direct attention to the various contributions by Mr. J. Moffat. In No. 460, frame of twenty-four cabinets (collodion), are to be found many forcible representations of well-known persons. In No. 463, frame of twelve portraits, and in No. 465, frame of seventy-two *cartes de visite,* we have likewise a collection of carefully-manipulated works—clear, fresh, and vigorous. Mr. Moffat also exhibits several enlargements painted in oil, such as *Dr. Maxwell Nicholson* (No. 909), *Professor Sir Robert Christison* (No. 901), and portrait of the *Rev. D. T. K. Drummond* (No. 890). These are all very effective works.

Among the productions of Mr. E. W. Dallas—whose work invariably indicates very great care—No. 367, eight portraits, shows several first-rate heads, and in No. 375, again, we have four portraits, all marked by singular depth and beauty of tone. No. 807 is a powerful *Reproduction in Carbon of Burns, by Naysmith,* and infinitely superior in strength of character to most of the engravings of the poet with which we are familiar.

Mr. J. Howie, Jun., shows a capital production in *Portrait of a Gentleman* (No. 226). It seems to be untouched, and is, of course, all the better for it. It is really a fine, characteristic head. Of Mr. Howie's other works may be noted No. 954, frame of twenty-four *cartes de visite;* No. 947, *Portrait of a Lady;* and No. 953, *Portrait of a Child*—all very attractive, as is also No. 383.

Mr. A. Asher contributes several reproductions from engravings, of which certainly the best is No. 661, *He Lives by the Way.* There are here fine character, great breadth, and very careful finish. His pictures, *Oliver Cromwell Looking at the Portrait of Charles I.* (No. 85), and *Be Slow to Anger* (No. 96), are picturesque and attractive in point of tone and finish; as are also his reproductions of *The Building of the Pyramids* (No. 634). From his *cartes de visite* portraits, Nos. 893 and 894, selected from his works, I am informed, very much at random, visitors will be enabled to judge of the general excellence of his work. Mr. Asher, in No. 913, exhibits a half-length portrait enlargement.

Messrs. Kyles and Moir, Portobello, have sent two paintings in oil, enlarged from *cartes de visite.* The gentleman's portrait, in particular, is very well handled. It is to be wished that they had contributed a few specimens of their excellent photographic work.

It would be impossible for me to conclude this paper without alluding to the admirable calotype productions of the late D. O. Hill, R.S.A. They happen to be so well known, however, that to dwell upon their beauties would be quite superfluous. Suffice it to say that Mr. Hill, with the keenest sensibilities of the educated artist, brought to bear upon this work an amount of knowledge vouchsafed to very few, if indeed to any. For graphic power, masterly breadth of light and shadow, and picturesque pose they are unsurpassed, and it is not at all surprising that these calotypes have, to photographers, become classic. In Nos. 358, 373, and 374 we have excellent collections of portraiture, contributed by Mrs. D. O. Hill, which will well repay careful study.

If all go well, it is my purpose to send a few more notes upon some of the works in this exhibition. In concluding this communication let me say that photographers far and near, as well as lovers of the art, should lose no opportunity of becoming acquainted with many of the *chefs de œuvre* here displayed, as it is not likely that a similar opportunity will again occur for a great many years. ALASTOR.

FOREIGN NOTES AND NEWS.

THE AUBELDRUCK PROCESS AGAIN.—KLARY'S SYSTEM OF LIGHTING.—THE COMPOSITION OF GUN COTTON AND COLLODION.

ACCORDING to the *Arbeitgeber* the Aubeldruck process, by which a photographic negative is converted in a few hours into a printing plate as hard as steel, and which has been kept quite secret by the inventor, has at length become known. It is as follows:—"A photographic negative, obtained by the precipitation of silver upon glass, is intensified, its parts covered with silver being strengthened by a further layer of silver, applied galvanoplastically—an operation occupying about two hours. The plate is then exposed to the action of hydrofluoric fumes. These fumes attack the plate wherever it is unprotected by silver, and in a short time produce a printing plate the drawing of which is etched exactly like the photograph. That strokes only, but not tones, can be reproduced by Aubeldruck is evident." The foregoing explanation has been going the round of the papers, but, as the *Archiv* says, it had better be taken with a grain of salt. The *Archiv's* own supposition is that a collodion negative is intensified galvanoplastically, etched by the fumes of fluoric acid, and then washed from the plate. The etching remaining on the glass is then rolled with lithographic printing ink, and a sheet of transfer paper being placed over it it is pulled through the press, by which means an impression suitable for transferring to stone is obtained.

In answer to inquiries about the actual worth of M. Klary's system of lighting Herr Luckhardt, of Vienna, makes a reply of the following import:—The arrangement for lighting consists of a screen, such as was described years ago in American photographic papers; the difference being that instead of a permanent cover M. Klary uses, according to the state of the light, a light yellow, blue, or red silk cover for the screen. With most of M. Klary's observations on methods of lighting Herr Luckhardt entirely agrees, yet he does not consider M. Klary's pamphlet, though very suggestive, as worth a hundred francs—nor, indeed, as more valuable than the observations on posing and lighting already published by Grasshoff, Robinson, and Bigelow.

With regard to the letter from Herr Luckhardt which figures amongst M. Klary's testimonials, the former says that he received from M. Klary a copy of his pamphlet with a request that he would give his opinion of its contents. In replying he said that from what he had read in the pamphlet he had no doubt that M. Klary was an experienced and skilful photographer, that he fully agreed with the principles of lighting as therein expounded, and that he had made similar observations himself; but he did not think it would sell in Germany, as his countrymen were unwilling to buy expensive secret processes; and, besides, that of M. Klary's, though very suggestive, really contained nothing previously unknown. He, therefore, advised M. Klary to sell his *brochure* for a moderate sum, not exceeding ten florins per copy; or, better still, to sell the right of translating it into German to the publisher of some photographic journal, and allow him to bring it out in the pages of his periodical. He authorised M. Klary to publish the substance of these remarks should the latter think them worth while, but he was rather surprised to find that the latter portion of his remarks was suppressed altogether.

Under the circumstances the suppression does not appear so very astonishing nor unusual a course for M. Klary to pursue, since, having made up his mind not to follow the advice contained in the latter part of the remarks, they were of no use to him, and they would not further his cause with the public, while the first part might. The publication of the extract, though not altogether justifiable in its present form, was quite natural, and need, therefore, have excited no surprise in Herr Luckhardt's breast. Herr Luckhardt's position, on the other hand, is easy to understand. When asked for a testimonial by a brother photographer he did not like to be unfriendly and refuse; yet, on the other hand, he did not wish to say more than he felt justified in doing. He, therefore, would have preferred that the whole of his remarks should be given or none. In future he will probably be less complaisant.

In speaking of an essay read at a recent meeting of the Académie des Sciences, by MM. Champion and Pellet, on the composition of various sorts of pyroxyline, the *Mittheilungen* says the sorts specially treated of were Abel's compressed gun-cotton, paper collodion, and Russian collodion. They find that, according to the kind and preparation of the cellulose and the length of time it has remained in the nitric or sulphuric acid, pyroxylines, the nitrogenous contents of which vary, are obtained. Compressed gun-cotton prepared by Abel's method contains two and a-half atoms of nitrogen, and of Russian collodion, whose excellent properties are well known, the same quantity. Paper pyroxyline, on the contrary, contains only two atoms of nitrogen.

Unfortunately these experiments of M. Champion do not agree with those of Mr. Abel. Mr. Abel says that true gun-cotton contains three atoms of nitrogen, while the soluble collodion cotton only contains two atoms. MM. Champion and Pellet again maintain that the gun-cotton prepared by Mr. Abel, at Woolwich, contains but two and a-half atoms of nitrogen, and that as much is to be found in many good soluble collodion cottons—such, for example, as that of the celebrated Mann, of St. Petersburg. However, the gun-cotton prepared by M. Champion himself contained only two and a-half atoms of nitrogen, and the *papier oxyl* only two atoms.

M. Champion is thus of opinion that there exists an explosive insoluble (or nearly insoluble) cotton having the same composition as the soluble, photographic, slightly-explosive collodion cotton.

This, however, the *Mittheilungen* regards as doubtful, not only because gun-cotton, of which twelve per cent. is soluble, is considered in England unsuitable for military purposes, but on account of the discrepancy between the results obtained by Mr. Abel and those of MM. Champion and Pellet. The *Mittheilungen* is at length left in a state of doubt as to whether the cause of the discrepancy is the inferiority of the samples of gun-cotton analysed by the latter gentlemen or the inadequacy of the tests employed. (They determined the nitrogen by reduction with iron salts.) Finally: it is of opinion that the subject is worthy of further attention and experiment.

SCIENTIFIC JOTTINGS.

AN opportune and important letter has been written by Mr. Joseph Sidebotham to the Manchester Literary and Philosophical Society, and in it he expressed a desire that it should be published in their *Proceedings*, and so made public. It refers to the use of aniline colours by photographers and artists, more especially to such colours as are used for tinting photographs. He affirms them to be *extensively* used in paintings and water-colour drawings, and he hopes the authoritative utterances from some of our chemists as to the fugitive nature of nearly all such compounds may lead to a stop being put to this deleterious practice. In former times it was, also, the practice to make use of these colours in the manufacture of carbon tissues, magenta being a great favourite; but we are not aware that they are now used for the purpose. If, however, there should be any doubt on the subject it would not be a difficult matter to ascertain. A piece of the suspected tissue, about an inch square, might be placed in enough hot water to dissolve the pigment, and have, when cool, about ten per cent. of strong ammonia solution added, and, after brisk agitation, about five per cent. of chloroform. After a final shaking the mixture is allowed to stand, when the chloroform falls to the bottom; after which it can be separated by a pipette or other means. A small piece of white silk is dipped into the chloroform and heat applied; as the volatile fluid escapes, the magenta, if any be present, will dye the silk of a more or less deep rose colour. That the colour is magenta may be proved by dipping the fleece in ammonia, which causes the dye to disappear, to return again in driving off the ammonia by heat.

While upon the subject of testing we may give a simple means for ascertaining the purity of salicylic acid—a chemical which promises to be of use in varied places in photography. A small quantity is dissolved in ten times its weight of strong alcohol, and the clear liquid poured into a watch glass and allowed to evaporate slowly at the ordinary temperature. The acid will form fine groups of efflorescent crystals round the edge of the glass—of a pure white colour if the acid had been crystalline, and a yellowish colour if precipitated. If the crystals are at all brown the acid is impure.

As yellow and red dyes are often the subject of experiment for colouring films, it may be well to publish a caution about the use of the beautiful new orange dye, "aurantia." It has upon some persons a powerfully-irritating action upon the skin, causing a severe eruption, similar to that produced by croton oil. One firm has ceased to manufacture it on that account. A. C. Martins, however, states that this action must be due to an impurity, as some which he prepared and submitted to professional investigation was quite innocuous. It is further necessary to state that it is violently explosive; consequently it should be kept moist with glycerine.

Two new and useful applications of this latter liquid has been published by Professor Church. He states that he has used it for some time for preventing the adhesion of india-rubber tubing to the inlet-pipe of Bunsen's and other burners used in the laboratory. A drop or two of *pure* glycerine is to be smeared on the parts. The second application is for preventing the leakage of paraffine oil through the cement used for attaching the metal burner of the paraffine lamp to the reservoir. He says that if this cement be first soaked with glycerine before oil of any kind has been introduced into the lamp the annoyance will not occur.

Those who are of an economical turn of mind, and inclined to use gas-piping for making their water-supply connections, are advised not to do it, this tubing, called "compo.," being readily acted upon by water, especially when frequently made alternately wet and dry.

We find a note by W. Skey, of the New Zealand Institute, relative to argentic sulphide, in which he states that it is decomposed by cupric chloride alone, without the presence of an alkaline chloride. A single experiment which we once made did not bear out the statement, though we did not carry it out to extremes. A developed plate, which had been allowed to remain in an old hypo. bath several days, the image being then converted into sulphide, did not show any signs of yielding to the action of the cupric solution even when strong. He also says that, "contrary to what is alleged respecting it (the sulphide), it is soluble in potassium cyanide at ordinary temperatures." There are few photographers who could not have told him of this years ago.

The same gentleman, however, gives some particulars, interesting to photographers, of the solubility of various alkalies in ether, and, so, of their suitability for "drying" it. He finds distinct proofs that ether containing water dissolves appreciable quantities of caustic potash, sodium carbonate, lime, and magnesia, but very little of sodium bicarbonate. The pure anhydrous liquid he found to dissolve minute quantities of caustic potash.

Some explanation of the process undergone by the oil of elæococea when exposed to light under certain circumstances, which we alluded to on a former occasion, has been given by M. S. Cloëz. In oil congealed under the influence of light one of the constituents of oils—the liquid elæomargarin—is changed into solid elæostearine, the ordinary oleine undergoing no change. But when the oil is for a long time heated to 180° with the exclusion of air, the elæomargarin is completely transformed into elæoline, and loses its power of becoming solidified under the action of light.

There are, too, still further details respecting a subject more than once taken note of by us—the production of cold by nitrate of ammonia. The conclusions arrived at, in a lengthy article by J. Tollinger, are that this solution is especially valuable when the temperature at starting is above freezing point, and that the greatest economy is obtained by using a solution of such a degree of concentration that it will be exactly saturated when the desired temperature is obtained.

In an article in *Comptes Rendus* is a paragraph which may contain the germs of a useful process for rectifying baths. It is stated that many substances which under ordinary circumstances are not affected by chlorine and bromine, even at elevated temperatures, are readily attacked by them in the presence of animal charcoal. By means of this substance most of the reactions which have hitherto been found possible under the influence of light only may be very easily effected.

In connection with certain meteorological conditions which we dwelt upon in an article we published some months ago, we were interested in a paper read at the Meteorological Society, by the Hon. Ralph Abercrombie, on *Visibility; or Unusual Clearness and Nearness of Distant Objects.* It is, he states, a very trustworthy prognostic of rain in this and many other countries. The usual explanation of the phenomena—much moisture in the atmosphere—he considers not borne out by observation. In this country great nearness occurs on a clear, brisk day, when hard masses of cloud shade the glare of the sky from crossing direct light sent from distant objects, and make clearness so great as to give the impression of nearness. The kind of rain which immediately follows nearness is short, sharp showers, but unsettled weather often follows later. As this state of the atmosphere, if unattended by much wind, is the very kind required for the best class of landscapes, photographers will do well to make a note of this paper.

An interesting communication has been recently made to the Physical Society by M. Janssen, with reference to an investigation we recently alluded to in our "Jottings"—the question as to the existence or absence of planets between the Sun and Mercury. He alludes in his note to the great importance of photography to astronomers, and he explained his reason for hoping that a series of solar photographs—taken regularly at intervals of about two hours at a number of places on the earth's surface—would enable us to determine this question, which is now agitating the scientific world. He exhibited some of the original photographs, taken in Japan, of the transit of Venus, and explained the advantage of using a grating to be photographed simultaneously to avoid any errors through distortion.

At the Royal Society, a week or two afterwards, a communication—also in connection with astronomical photography—was made by Mr. Huggins. It bore reference to obtaining photographs of the spectra of various stars. Fourteen years ago such attempts were made; but, owing to certain mechanical impediments, the trials were not continued. Upon recently taking the subject in hand again successful results were obtained, and photographs were shown of the Moon, Vega, Venus, Sirius, &c. After an extensive trial to discover the most efficient photographic processes, preference was given to dry plates, wet collodion having been the medium used in the earlier experiments alluded to.

A successful attempt has at last been made to photograph musical sounds by Dr. Stein, an account of his experiments being given in *Poggendorff's Annalen.* The principle of his mode of working seems to consist in throwing a reflection from the vibrating tongue or cords upon a rapidly-moving plate. The lines and curves obtained are stated to be very beautiful. Dr. Stein is able to photograph all musical tones—even those which are known to exist, though from their extreme acuteness they are not able to be heard by human ears, following the analogy to light, in which, as all photographers know, there are certain rays—indeed the most powerful of all—which are invisible, yet are able to impress the sensitive plate. This is one of the most novel and interesting achievements of photography of late years.

These new experiments will be materially aided by the introduction of electrical communications to the driving clock which have been designed by Mr. Howard Grubb, of Dublin.

Meetings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

An ordinary meeting of this Society was held on Tuesday last, the 9th instant, at the Gallery of the Society of Painters in Water Colours, Pall Mall East,—Mr. James Glaisher, F.R.S., President, in the chair.

After the passing of the minutes of the previous meeting, the President called upon Mr. Fry to open a discussion on carbon printing.

Mr. Fry, after referring to the recognised fact of the fading of silver prints, said that although some subjects might require an apology for their introduction none would be required for carbon printing—a subject that was of paramount importance at the present time. He then referred to the services rendered by M. Lambert, who had done so much to render carbon printing practicable, especially in its application to portraiture, observing that he had felt it expedient to obtain a license to practice that process under the patents held by the Autotype Company, as he could not otherwise obtain tissue of the kind he required. Having made allusion to difficulties which beset a beginner in carbon printing, he (Mr. Fry) said that silver and carbon had one point of similarity—pictures printed on plain films of either were opaque, and it became necessary to resort to some transparent medium to give the requisite transparency. For silver printing albumen had been adopted; and for carbon, collodion. During the early days of photography they were adjured to give up the vulgar gloss of albumen; but, as a matter of fact, no man who saw a picture on plain paper and on albumenised paper could for a moment hesitate which to accept. So it was with carbon until M. Lambert came and gave it the collodion surface; and by that system, to which the name of that gentleman had been given, carbon portraiture, previously objectionable from its solid opacity, had been rendered practicable. Whether the collodion surface was in any sense a permanent one was a question of importance which he was not prepared to answer. Fortunately they were not necessarily obliged to have the pictures of the extreme gloss frequently seen, for by stripping the photograph from its glass and mounting it in the usual way it did not differ in appearance from albumenised prints. He (Mr. Fry) concluded by handing round for examination several carbon prints of great excellence, executed by Mr. Sachs, of Bradford, together with transparencies of his own preparation.

Mr. H. Baden Pritchard then read a short paper on the subject of carbon printing. During the seven years that carbon printing had been practised in Woolwich Arsenal over one hundred thousand prints had been executed. He spoke of "reticulation" as one of the most common difficulties to be encountered in carbon printing. That might be produced by exposing the tissue to a temperature of 100° Fahr. for a short time, or by placing it under an air-pump with sulphuric acid, by either of which operations the gelatine was robbed of too much of its moisture. The development of the picture upon a yielding, springy surface favoured immunity from reticulation, and it was necessary also that the picture be soaked in cold water previous to development. He (Mr. Pritchard) concluded by directing attention to a large collection of carbon prints, upon one of the tables, that he had brought for exhibition, and which were of an excellent character.

A short communication from Colonel Stuart Wortley, who was unavoidably absent, was read by Mr. J. Spiller. He spoke of the advantages of the Lambertype process.

Mr. Jabez Hughes had been an ardent worker in carbon for ten years, but it was only recently that he had been enabled to work to his own satisfaction; for he had set up as a standard silver prints of the highest quality. The conditions laid down by him to be fulfilled before he determined upon the adoption of carbon printing permanently were—first, that it should be definitely established as being practicable; and, secondly, that it should yield results quite equal to those obtained by silver. In the carbon prints he looked for beauty *plus* permanency, and this they had now obtained. He credited M. Lambert with being the introducer of carbon printing as it was now being practised in this country; and when he saw the conditions under which M. Lambert worked, he (Mr. Hughes) went home and gave up silver printing. But certain difficulties arose during the warm weather which necessitated his return to silver for small work, and this short return to silver had disgusted him more than ever with the uncertainties and irregularities of the silver process. On returning, however, to carbon for even small work he was more than ever satisfied with its importance; but he ought to mention that it had its peculiarities at least, if not its difficulties, and these required to be specially studied. The worst of it was that the previous education of the photographer by no means fitted him to cope with them. It was too commonly understood that a man who had had a good photographic education was prepared to overcome all the difficulties that arose in all photographic processes. This idea was eminently incorrect in relation to carbon printing, and a man was apt to think that when difficulties arose they were to be attributed to defects in the materials, whereas they really occurred from his inability to know how to use the latter. In fact, this unfortunate circumstance occurred—that a man's previous photographic education, instead of being useful to him, often stood in his way; and it might be found that many an uneducated man, having nothing to unlearn, would make more rapid progress as a carbon worker than a veteran silver printer. A year ago, when referring to the subject, he had stated that his impression was that some negatives printed better in silver than in carbon, and *vice versâ;* and he then thought that for the highest excellence in carbon special negatives were required. Increased experience had, however, induced him to change his opinion, and he now made the assertion, deliberately fortified by the experience of other workers, that whatever the character of the negative might be—whether thin or dense, whether over- or under-exposed—whatever their peculiarities might be, that more perfect prints could be produced from them in carbon than in silver.

CAPTAIN ABNEY, speaking as a carbon worker of seven years' experience, and referring to the difficulties in the working of the carbon process, suggested a means of avoiding some of these by studying the nature of the materials by which the tissue was composed. He had done so himself, and, profiting by the knowledge thus acquired, he recommended the same course to others.

Mr. FRANCIS BEDFORD had observed that most carbon prints had a highly-glazed surface, which was very inartistic, and he wished to know whether that was a necessity of the process.

Mr. Hughes explained that the presence or absence of glaze on the surface had nothing whatever to do with the process; but that every variety of surface, from the highest glaze to the dullest matt, could be produced at will in the course of the manipulation. The high glaze was only produced in obedience to popular demand.

Mr. PRITCHARD made some remarks to the same effect.

Mr. F. HOWARD bore testimony to the usefulness of a collodion surface as a protection from fading in the case of silver prints, and thought it probable it would serve the same purpose in carbon pictures.

Mr. V. BLANCHARD said that the highly-polished surface was extremely useful for rendering the detail in small work, and he cited the daguerreotype process, where on the highest possible polished surface the most perfect detail was rendered that had ever been produced by photography. He desired to known if the heavy tones he often saw pervading carbon prints were not produced by the peculiar pigments employed, and whether by the selection of other ones a greater degree of transparency in the shadows could not be produced.

The CHAIRMAN observed that he saw Mr. Sawyer present, and inquired whether he had had any experience in carbon printing. (A laugh.)

Mr. J. R. SAWYER said that he had had a very great deal of experience in carbon printing and also in the manufacture of the tissue. With reference to Mr. Blanchard's suggestion, that greater transparency might be obtained in the shadows by the use of a blacker and more opaque pigment, he thought that such desirable quality could scarcely be obtained by working in that direction, and he inclined to the idea that, by diluting the carbon basis of the tissue by the addition of transparent pigments, the quality desired would be secured. He was supported in this idea by the nature of the pictures obtained by the "engraving black" tissue, which exhibited the opacity of the shadows in the greatest degree. Still he would bear in mind Mr. Blanchard's remarks, as his firm were anxious in every possible way to avail themselves of all suggestions in order to improve the tissue. He then referred to the subject of reticulation, and detailed an interesting experiment with a given sample of tissue, two pieces of which were dried in different ways; the prints produced upon one showed reticulation in the most extraordinary manner, while in the other it was entirely absent. He (Mr. Sawyer) then, in referring to silver printing, said that the present perfection of it was the result of endless pains and trouble, and that the difficulties of mealiness, measles, and other faults were only surmounted after the exercise of patient and persevering effort distributed over many years; and it was only reasonable to suppose that the difficulties that now presented themselves in connection with the carbon process would all be overcome by the same patient attention and perseverance.

After some further remarks,

The CHAIRMAN expressed himself gratified with the result of the discussion, which, he felt, was not nearly exhausted.

A vote of thanks was passed to Mr. Fry and the other gentlemen who had taken part in the discussion.

The next meeting will be held on the 13th prox., when, after the annual business of the Society is terminated, Mr. H. Baden Pritchard will read a paper *On Photography from the Tourist's Holiday Point of View.* It was also announced that at the meeting in March a discussion will take place on the subject of the *Nitrate Bath,* introduced by Colonel Wortley and Mr. J. Spiller.

We here append a letter we have received from Mr. J. A. Spencer, on the subject of carbon printing, bearing on the points discussed at the meeting:—

To the EDITORS.

GENTLEMEN,—With reference to the discussion upon carbon printing inaugurated by Mr. Samuel Fry at the meeting of the Photographic Society of Great Britain last evening, there are one or two remarks on the subject of "reticulation" of the tissue which I should like to make. It was shown by more than one speaker how the *effect* of reticulation could be produced, but not so much was said about the *cause* of it.

The observations of M. Placet have led him to notice that when a sheet or film of gelatine is immersed in a solution which has a *tendency to dissolve it,* and afterwards with a second solution having a *tanning* or *contracting* property, the whole surface is covered with a grain caused by the contractions it has undergone. He notes that the thickness, form, and depth of this grain varies according to the substances and the liquids employed, and upon this he has based a process of photographic engraving, for which he took out a patent in 1874.

We may readily imagine, then, that when a sheet of tissue is immersed in a solution of bichromate, especially in hot weather, or when the gelatine employed has been in a somewhat too soluble condition, the action of heated air, which always has a tendency to produce insolubility in bichromated gelatine, will, by inducing an insolubility of the surface, produce the "contraction" referred to by M. Placet.

Rapid drying was voted as one of the means of producing this effect, and if this refer to drying by heat I fully agree with the statement; but I have had tissues very rapidly dried by means of cool, *dry* air, which have shown no tendency to exhibit this phenomenon.—I am, yours, &c.,

9, *Gratton-road, West Kensington,* JOHN A. SPENCER.
January 10, 1877.

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EDINBURGH PHOTOGRAPHIC SOCIETY.

AN ordinary meeting of this Society was held at 5, St. Andrew-square, on Wednesday evening, the 3rd instant,—Mr. John Lessels, President, in the chair.

The minutes of the last general meeting were read and approved, and Messrs. James K. Brown, John Howie, John Houlden, George Mason, Thomas R. Rodger, Jun., James Adamson, Alexander Dinnie, M. Macpherson, George Cheyne, R. Anderson, R. Middlemas, J. Geddes, Edwin Smithells, and David Greig were admitted ordinary members.

The Council reported that they had considered the remit made at last ordinary meeting, and begged to recommend that a presentation picture be given to the members, to be printed by one or other of the carbon processes, from a negative to be selected from the pictures at present on exhibition.

After considerable discussion it was resolved to select one picture, and that the selection be left to the Council, the members of which were requested to enter the name and catalogue number in a book provided for the purpose, to be found on the superintendent's table in the galleries. It was also resolved that two other pictures be selected in the same way and supplied to subscribers at such prices as might be arranged by the exhibition committee.

Messrs. Kemp and Co. then exhibited an improved sciopticon, which was explained by Mr. Bashford, who used it to show a number of very fine transparencies of physiological, botanical, and mechanical subjects forwarded by Herr Ganz, of Brussels. The improvement claimed for the sciopticon in question is the absence of the dark line generally present on the disc of the original instrument.

A number of very beautiful pictures, contributed by Mr. Pillans, were then distributed by lot; and, after the usual votes of thanks, the meeting was adjourned.

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BRISTOL AND WEST OF ENGLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE ordinary monthly meeting of this Society was held on Wednesday, the 3rd inst., at the Museum, Queen's Road, Bristol,—Mr. P. J. Worsley, F.C.S., one of the Vice-Presidents, in the chair.

The minutes of the previous meeting having been read and confirmed, the Secretary handed round some pocket almanacs sent for the members by Messrs. Cussons and Co., of Southport, after which Mr. Aldridge, of Bristol, was elected an ordinary member of the Society. Messrs. Webber, Boyden, and Strachan were elected members of council.

The Chairman then called upon Mr. H. A. H. Daniel to read his paper on *Light, Exposure, and Development* [see page 18], after which,

Lieut. LYSAGHT spoke of the shutter mentioned by Mr. Daniel as not being of recent introduction, having been brought out by Canon Beechey some few years ago.

The Chairman considered it far more advisable to get the clouds from a separate negative.

Mr. Brightman spoke of a remark made by Mr. Daniel as to the discolouration of Canada balsam in lenses as caused by light, and rather doubted it, and which he thought was pretty well proved when he once bought an old lens at a second-hand bookstall, the cement of which had greatly changed colour, but the rim of the cell had quite covered one part of the balsam, which was quite as much discoloured as that fully exposed.

Lieut. Lysaght upheld Mr. Daniel's assertion relative to the discolouration of the balsam—often, in careless eyes, condemning a lens; and instanced the case of a friend of his who bought for very little money—an apparently discoloured lens, when it turned out to be only the cement which was discoloured, the lens being a very fine one.

The Chairman drew attention to the very different colours various kinds of glass would turn.

Mr. Daniel reverted to his statement relative to the assistance to development that pouring the developer off the plate for a few seconds gave, and hoped some present might throw light on the subject.

The Chairman suggested that when the quantity of developer on the plate was reduced, as it were, simply to a thin film, the temperature of it might be raised, thereby causing the result spoken of, although quantity did not, as a rule, affect chemical action; and generally, in chemistry, it was found that the presence of a greater quantity of a reagent caused more energetic action.

Lieut. Lysaght asked what was the result of a mixture of loaf sugar and nitrate of silver.

The Chairman said that he was not aware of any compound that would be formed thereby—certainly nothing perceptible.

Mr. Webber inquired the object of adding loaf sugar to the nitrate bath.

Mr. Daniel said that he found a good-sized lump very useful in causing the plate to keep moist longer, and so facilitate the production of clean negatives.

After some further discussion on the use of boracic and acetic acids in the negative bath, and a vote of thanks to Mr. Daniel for his paper, the meeting was adjourned.

BERLIN PHOTOGRAPHIC SOCIETY.

This Society met on Friday, the 17th November,—Dr. Vogel occupying the chair as usual. After making some announcements about the prizes awarded at Munich,

The Chairman said that the medals were not awarded at Philadelphia invariably in accordance with the recommendation of the jury. Of the forty American photographers to whom awards had been recommended eighteen were erased, and he had remonstrated on their behalf with the centennial commission. He (the Chairman) then gave Herr Luckhardt's reply to the inquiries about Klary's method of lighting, the substance of which is given in our *Foreign Notes and News.* [See page 20.]

A long discussion on the vexed question of blisters in albumenised paper, and the influence of the fixing bath in producing them, followed, in the course of which

Herr Prümm said that he added fresh soda to the fixing bath every day, and that he first placed his pictures in a weak soda bath, then in a strong one, and lastly back into the weak one before washing them up.

Herr Reichard said he had been recommended to lay the pictures in an alum solution after removing them from the soda. He had tried this, but the pictures were completely spoilt, especially in tone.

Herr Fechner had used the alum bath without injury to the pictures, and found it efficacious in preventing blisters; but his alum solution was very weak, and he did not allow the prints to lie long in it.

Herr Schaarwachter also added soda daily, and placed the prints first in a weak bath and then in a strong one.

Herr Hartmann thought it better to use the weak solution *after* than *before* the strong one.

Herr Grüne believed the blisters were caused by the action of a well-known physical law in this way:—When the print saturated with soda is placed in water, the soda runs out of the paper and the water takes its place. But, as the water is more fluid than the soda solution, it runs in faster than the latter runs out, and getting between the layers of the paper causes blisters; so that the more dilute the solution of soda—that is, the closer its resemblance to pure water—the less the danger of blisters. He therefore agreed with Herr Hartmann.

Herr Roloff remarked that he had got more blisters with a new soda bath than with an old one. He had tried to prevent them by washing the prints in warm water, but that only made them worse. An addition of salt to the washing water had, on the contrary, visibly decreased their numbers.

The Chairman said that in America, where photographers were tormented during the heat of summer by the formation of blisters, Mr. Rocher, of Chicago, and Mr. Rulofson, of San Francisco, took the following means of preventing them:—After printing the prints are washed in common water, and then placed in a solution of a handful of salt in a litre of water; after which they are toned. They are then placed in a *concentrated* salt solution, fixed, put back into another solution, and finally washed.

The subsequent proceedings were not interesting, nor did anything of general interest transpire at the meeting of the 1st December.

CHICAGO PHOTOGRAPHIC ASSOCIATION.

At the last meeting of this Association, Mr. P. B. Greene, the President, read the following paper on *An Old Bath*, of which we give the following abstract:—

Can the negative bath be over-iodised? This has been one of the subjects of discussion before our Society for the last two or three meetings. The general opinion among photographers has been that what has been called a "pinhole" bath is an over-iodised bath. Mr. Hall's able paper on this subject at our last meeting illustrated to us that it is not iodide of silver which causes pinholes. Iodide of silver, in excess of the amount dissolved in the solution, will precipitate to the bottom, or can be filtered out; but no amount of filtering will cure a "pinhole" bath.

If it is not iodide of silver, what is it? and can it be avoided? We are all aware of the trouble it has caused us, and if it can be avoided a great boon will be conferred upon the photographer. I will state that I am using the same negative bath I used fifteen years ago. Of course it has had copious additions to it in the shape of nitrate of silver and water; and I can assure you it has been full of pinholes a great many times, and has had all the *ills* the bath is heir to. It has also been dosed and doctored by all the known remedies; but for the last five or six years I have adopted but one practice, as follows:—Pour the solution into an evaporating dish; put in sufficient bicarbonate of soda solution to make it slightly alkaline, and evaporate enough by heat to drive off the alcohol and ether. When cool, add water to bring it to forty grains to the ounce; then sun it for ten or twelve hours, let it stand until it is settled perfectly clear, filter, and it is ready for use.

It will require a few drops of nitric acid; but do not add the acid until after it has been filtered, as the acid will dissolve the dirt and foul matter, which will filter out when neutral. I have not taken any other method to get rid of what is called "excess of iodide in the bath" for the last five years; and I do not believe it is necessary to precipitate the iodide of silver in the bath. I have discovered that I can dip as many plates in the bath by this process of purifying as I used to do when I practised the old method of precipitating iodide of silver by adding water to the bath.

I am reported to have said that I used washed iodide of silver to iodise the bath; it should have been credited to Mr. Hall. I dissolve iodide of potassium in water and add directly to the bath. The quantity the bath will take up is so very small there is no use in going to the trouble of preparing washed iodide of silver. One grain of iodide of potassium will saturate thirty-two ounces of a forty-grain bath; that quantity cannot injure it when a bath which has been in constant use for years, and has had thousands of plates dipped into it, remains in good working order now, and is better than a new one.

The members then discussed the subject at some length.

A Member: How many plates can be immersed in the bath before pinholes appear?

Mr. Greene said he had dipped a hundred 5 × 8 plates in a 7 × 9 bath.

Mr. Smith said he used three-quarters of a grain of iodide to one grain of silver.

Mr. Greene used a bath saturated, or added iodide as long as it would dissolve, until there was a sediment at the bottom.

Mr. Drummond had used gelatine to get rid of the water in the collodion, and still there would be pinholes. He had put three or four ounces of water in a bottle, poured his silver bath into the same, filtered, used, and found the pinholes had all disappeared.

The meeting was shortly afterwards adjourned.

Correspondence.

RESIDUES.

To the Editors.

Gentlemen,—In your article in The British Journal of Photography of this morning, upon saving the residues from carbon printing, you credit me with the suggestion of adding a "small quantity" of ammonia to the solution of bichromate of potash used for sensitising.

I am not aware that I have ever suggested this; but I have recommended in certain cases the addition of an *excess* of ammonia, so as to ensure the conversion of the bichromate into the double chromate of potash and ammonia.

This is especially useful in cases where the pigment employed has a tendency of itself, without insolation, to cause insolubility of the gelatine.

I may refer to this article at a future time.—I am, yours, &c.,

John A. Spencer.

9, *Gratton-road, West Kensington,*
January 5, 1877.

ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

H. G. Glen.—We will communicate with you.

Thomas M. Laws.—Received. Thanks. In our next.

W. Richardson.—The alba plates can be used for the purpose suggested.

G. S.—The paper mnst be exposed in the camera while in a slightly moist state. If it be allowed to become dry the exposure will have to be greatly prolonged.

J. Severs.—We have never felt it necessary to modify the safety valves. They can be constructed by any one who possesses a slight amount of mechanical skill.

Carbon *v.* Silver.—The prices are nearly similar. For replies to your other queries see the last edition of the *Autotype Manual*, recently published. See also the advertisement of the Autotype Company in our advertising columns.

R. P. H.—The precise proportion of glycerine to be added to the gelatine must be determined by experiment. The better way will be to prepare two batches—one containing an excess of glycerine, and the other none at all—and then mix these in varying proportions until the desired effect is produced.

Country Photo.—The *best* way to increase the efficiency of the *carte* lens, so as to enable it to cover a ten-inch plate, is to have an extra set of lenses of long focus to screw into the mount. The next best thing to do is to procure a concave lens, of suitable form and focus, and place it between the two lenses of the combination.

G. C.—The *carte* lens, if used with a very small stop, ought certainly to answer the purpose of enlarging the drawing. Remember that the back lens of the combination must be nearest to the object to be enlarged. We have known of work of this kind having been admirably executed by means of a common landscape lens.

Thomas.—1. We know the author to be a very careful experimentalist as well as a successful worker; hence we infer that he would not have offered the advice in question unless he considered it necessary.—2. The gelatine may easily be removed in an entire sheet.—3. If the washing has been properly effected the gelatine may be dried in the manner you suggest.

A. Debenham.—Some remarks which apply to the subject of your note will be found in a paper, by Mr. H. A. H. Daniel, in the present number. We have heard of numerous instances in which deterioration of glass, by exposure to light, took place to a serious extent. There is a thin crown or sheet glass, of a slightly-greenish tint, now prepared, which is said to withstand the action of light.

S. G. F.—The best way of utilising the lens is to remove the ground glass from its frame and replace it at such a distance from its previous position as shall be equal to the difference between the visual and chemical foci. With respect to the question in the postscript of your letter: although there is some difference in the construction of the two lenses named there is none in their working.

Young's Oxygen Generator.—Mr. Young has sent us a reply to Mr. Birrell, from which we make the following extract:—"My apparatus can be used for every form of lime light. It has been tested side by side with gas bags in the presence of gentlemen who thoroughly understand the lantern, and admitted to produce quite as good a light with less oxygen. I can have the lime light at five minutes' notice, and if any oxygen remain it will keep good for months."

Alfred Watkins.—Your idea is praiseworthy; but a camera made of pine wood would not "go down" with photographers. You must have it constructed of mahogany, which will not cost much more. The focussing glass will not cause any fog when lying upon the bottom of the camera, provided the lens is so adjusted in relation to its mount as to confine the light to the sensitive plate, which may very easily be done. We have said "your idea is praiseworthy;" but we do not think that your proposed method of carrying it into effect would be such as to make the result either profitable to yourself or acceptable to the public. Are you aware of what has already been effected in this direction?

The Amsterdam Exhibition.—In reply to the query of a correspondent in our last number respecting this exhibition, we have received from Mr. P. Le Neve Foster a pamphlet on the subject, from which we are able to announce that the forthcoming Exhibition of Art Manufactures will be held during the ensuing summer at Amsterdam, and that applications for space will be accepted by the executive committee until the 1st of February next. In class 9 (Graphic Art in General) we find photography, along with engraving, zincography, letterpress and lithographic printing, and ornamental writing, &c. The executive committee at Amsterdam supply printed forms upon which to make application for space.

Insurance of Studios.—Mr. Frank M. Sutcliffe says:—"I have been making inquiries respecting the insurance of my photographic apparatus, materials, and negatives, and am told that I cannot insure the latter at all, and that I shall have to pay at the rate of 7s. 6d. per cent. for the former, or about two-thirds more than the ordinary rate. The above information was given me by the 'Guardian' office. Will you, or any of your readers, kindly tell me whether all insurance companies are equally stringent with photographers?" ——*Apropos* of paraffine stoves for warming studios Mr. Sutcliffe observes:—"I see in the Answers to Correspondents' column this week that you speak discouragingly of paraffine stoves. I beg to say that I have had one for for some months; and, although it does not give sufficient heat for warming my studio, yet for the reception, printing, and dark rooms it answers capitally. The offensive smell is caused by the stove standing where there is too much draught. For boiling the negative bath and for heating water it is very useful; the only drawback to its use is the present high price of petroleum. I had one of Bateman's metal fires, but could not get it to burn properly in the day time, as there was not sufficient pressure on the gas until about five o'clock in the afternoon."

South London Photographic Society.—The last meeting of this Society, held on Thursday, the 4th inst., was devoted to the exhibition of transparencies by the magic lantern, Mr. F. York being the exhibitor, and using on this occasion Young's oxygen generator. The pictures were provided by Messrs. Brooks, Ferneley, Bedford, Cutches, Ayling, and York. There was a considerable attendance, the Rev. F. F. Statham presiding, and the exhibition was quite successful.

Nautical Photography.—The *Buenos Ayres Standard* devotes considerable space to a description of the "Sunbeam" (the splendid yacht built by Messrs. Bowdler, Chaffer and Co., Seacombe, near Birkenhead), in which the owner, Mr. Thomas Brassey, M.P., with a party of friends, is now making a tour of the world. From this account we learn that Mrs. Brassey has on board a photographic studio replete with every appliance which forethought and a well-filled purse can supply. Seeing that before its return to this country the yacht will visit some of the principal islands in the South Pacific (including Juan Fernandez), Japan, China, and the East Indian Archipelago, returning home by India and the Suez Canal, we may hope that views may be secured of places and things never before reached by the camera.

Photography in Court.—Walter Allen (25), photographer, London, was charged with embezzling money, the property of George Albert Nicholls, his master, at Hitchin. Mr. Clarke and Mr. Grubbe appeared for the prosecution, and Mr. Forrest Fulton for the prisoner.—Elizabeth Nicholls, wife of G. A. Nicholls, photographer, Hitchin, said:—I manage the business at Hitchin. Prisoner was in my employ; it was his business to go out and take negatives, and send them home for me to finish. I authorised him to receive money for the finished photographs, and he had to account for the money received to my bookkeeper. He had a cash-book in which he had to enter all money received; the book was sent home every night, with the cash received, by the boy Dellar. Allen was not allowed to work on his own account. He had 25s. per week.—Cross-examined by Mr. Fulton: It was after he left we found he had embezzled 6s. He gave notice a week before and left on August 12th. When he was away and ran short of money he would stop it; but it was his duty to book it, and we settled on the Saturday. There was a dispute about 11s. I said if he got in all debts and finished his work he should have the 11s. On the day he left he handed over £7 5s. Three weeks before he left he was allowed commission besides 25s. per week.—Rebecca Fosdyke, bookkeeper to Mrs. Nicholls, said: On Saturday, August 12th, Allen came home and settled his account. He handed over £7 5s. I find no entry of money received from Mrs. Neale or Mrs. Cordell in the cash-book. He left on August 12th. On August 11th Dellar brought home two negatives and £1 4s. 6d.—Cross-examined: If he took over £8 in the week he was entitled to 2s. 6d. He was not paid the 2s. 6d. because he was in debt to the firm. He owed 14s. 6d. Mrs. Nicholls took 3s. 6d. off, and that left 11s.—Thomas Dellar said: I was in the employ of Mr. Nicholls. I had to bring home the cash, the cash book, and the negative book. On Friday, August 11th, I took £1 4s. 6d.—Several witnesses having proved the payment of money to Allen, Police-constable Anderson said: On October 18th, when I took prisoner to the magistrates, he said "I took the portraits and I kept the money to pay myself."—Mr. Fulton contended that it was a paltry case which ought to have been tried in the County Court.—Mr. John Simms, publican, Clifton, Beds., said he had known prisoner about five months and had always known him to be honest and respectable.—Verdict, guilty. Sentenced to three months, with hard labour.

APPLICATIONS FOR NEW PATENTS.

December 4, 1876.—"Improvements in machinery for printing *cartes de visite.*" No. 4679.—C. Valette.

December 30, 1876.—"Improvements in burnishers for photographs." No. 5065.—J. Wilkinson, J. Hardman, R. Birtwhistle.

METEOROLOGICAL REPORT,

For the Week ending January 10, 1877.

Observations taken at 406, Strand, by J. H. Steward, Optician.

These Observations are Taken at 8 a.m.

Jan.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks.
4	29·18	SW	50	51	52	44	Raining
5	29·24	W	45	46	54	45	Cloudy
6	29·35	SW	43	45	56	41	Raining
8	22·54	SW	49	50	52	46	Raining
9	29·71	N	48	49	53	47	Dull
10	30·05	NE	42	42	—	41	Foggy

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 872. Vol. XXIV.—JANUARY 19, 1877.

THE HYDROSULPHITE OF SODA DEVELOPER.

In our last number we published a communication from M. Sammann, of Paris, in which that gentleman describes a new form of developer for dry plates which, if found to bear out the claims made on its behalf, promises to occupy a prominent place in public favour. Up to the present time no attempts have been made to introduce other substances than the alkalies into that class of development of which alkaline pyro. may be taken as the type—that is, development at the expense of the silver contained in the film, as distinguished from the system of piling-on by means of silver contained in the developing solution; yet there is little reason to doubt that numerous other substances exist which possess the power of development when in combination with pyrogallic acid, and some, it may be, which might be employed with advantage in preference to the methods at present in use.

Such would appear from M. Sammann's article to be the case with hydrosulphite of soda, and it is plain that the action is not produced by the presence of any alkali, as the solution should be neutral; or, even if any slight trace of alkali should be present, the totally distinct character of the image produced, as well as the behaviour of the solution during the operation, prove emphatically that the principal effect is entirely due to some specific action of the hydrosulphite. It is a very common fallacy to suppose that development is dependent upon the alkalinity of the solution employed; but such is not the case, as may be proved by the fact that ammonia or other alkali alone will not perform development, unless indeed pyro. or a similar substance form a constituent of the preservative used. On the other hand, pyro. alone is incapable of satisfactorily doing this duty, though it will under certain circumstances exercise more or less action upon the impressed film. What is necessary for the proper performance of the function of development is pyrogallic acid in combination with some substance increasing its deoxidising or reducing powers; this is the part played by the alkali, and also it may be inferred by the hydrosulphite of soda, which is itself a powerful reducing agent. We may note here that though the best effect is obtained by using the formula given by M. Sammann, we have found that solutions of the neutral sulphite and bisulphite of soda, if added to pyrogallic acid, are capable of development.

During the short time the new method has been before us we have given it a very considerable amount of attention, and though—as indeed can scarcely be expected—we are not yet prepared to relinquish ammonia for the new substance we are, however, so pleased with the promise it holds out that we intend to persevere in its employment, fully believing that it contains the germs of a superior development to any of those hitherto in use. On the question of comparative rapidity we are as yet unable to speak, having devoted our attention chiefly to a study of the chemical points necessary to the production of an image suitable for ordinary negative purposes without instituting comparisons into other matters indirectly bearing upon it. As we have frequently had occasion to remark, we do not believe, strictly speaking, that development and sensitiveness bear any relation to one another; still it cannot be denied that a process which tends to produce detail with facility will give an effect practically equal to an increase of sensitiveness. In this manner it is possible that hydrosulphite of soda may offer an advantage over ammonia on account of its power of "searching out" detail, though it will be remarked further on that we have not experienced the same power of prolonging development as M. Sammann.

The formula we have worked is substantially the same as that given in our last week's issue, though for convenience sake we have reduced it to another form. It is as follows:—

1.	
Bisulphite of soda	1 ounce.
Water	2¼ ounces.
2.	
Pyrogallic acid	96 grains.
Absolute alcohol (pure)	1 ounce.
or	
Pyrogallic acid	8 grains.
Water	1 ounce.

It is important that the bisulphite contain no free sulphurous acid, which may be recognised by its action upon blue litmus paper. This is first reddened and then bleached by the vapour of the acid, or by a solution containing it; or its presence may frequently be detected by its odour, which is that of burning brimstone. Should free acid be present the solution must be carefully neutralised with carbonate of soda—a very slight excess of which is of no importance—and filtered. If the solution contain free acid it will be found, without treatment with zinc or the addition of pyrogallic acid, to produce a dense discolouration of the film before exposure. After it has been in contact with the zinc it is useless to attempt any correction, if it should have been previously neglected; hence it is well to test the bisulphite solution before treatment with the zinc by adding a little pyro., and pouring it on to an unexposed bromide film. If the latter show no trace of discolouration the solution is all right.

Procure a wide-mouthed bottle of suitable size (four or six ounces will be found convenient), and about three-parts fill it with granulated zinc. Pour in hot water and agitate briskly, repeating the operation three or four times with fresh water or until the latter comes away free from impurities. It is then ready for use in the preparation of the hydrosulphite of soda. This merely consists in pouring the filtered solution of bisulphite of soda into the bottle containing the zinc, where it is allowed to remain until required for use. The solution acquires its developing power in about half-an-hour, after which it may be poured off the zinc or allowed to remain, as may be preferred. The latter course is the more convenient, and presents no objection that we can discover. The resulting solution should be perfectly clear and bright, though it may contain minute particles of metallic zinc or its oxide derived from the contents of the bottle. If it should be milky or turbid and a greyish white precipitate form in the zinc bottle, it is a certain sign that free sulphurous acid is present. If such be the case hydrogen will be evolved, and a very slight odour of hydrosulphuric acid (sulphuretted hydrogen) will be noticeable. Such a solution must be at once rejected.

It will be noticed that we have given an alternative method of using the pyrogallic acid, but this is merely to suit the convenience of each individual, and has no effect in modifying the action of the developer.

M. Sammann's formula provides four grains of pyrogallic to each ounce of developer, so that if the alcoholic solution be employed it will be necessary to use five minims to each drachm of the hydrosulphite solution previously diluted with an equal quantity of water; that is, one grain of pyro. in a quarter of an ounce of developer. If an aqueous solution be more convenient it should be of the strength of eight grains to the ounce, which mixed in equal proportions with the hydrosulphite of soda gives the same result. The mixed developer takes almost instantaneously a delicate tint of brownish pink of about the same depth as liquefied carbolic acid, which, indeed, it much resembles. This colour does not deepen noticeably for some considerable time; but if left for twenty-four hours it will be found to have assumed the deep brownish-black appearance usual with alkaline pyro., but with the difference that when diluted sufficiently to show its real colour the latter proves to be scarlet; no sediment is formed, the solution remaining perfectly clear, however great the discolouration may be.

In his instructions for development M. Sammann directs that the plate is to be first moistened with water. With some descriptions of plates this may be permissible; but in those cases in which, with ordinary development, the plates require to be moistened with dilute alcohol the same advantage will accrue from the use of alcohol with the new developer. We mention this because it might be supposed, from the explicit nature of the directions given, that the use of alcohol is objectionable; on the contrary, however, we have proved that with washed emulsion plates there is no comparison between the results obtained by the two methods.

After moistening the plate in the ordinary manner with dilute alcohol, and washing, the developer is applied, and the image commences to appear in a very few seconds. At its earliest stage it resembles perfectly the image produced by alkaline pyro.; as, however, it gains strength it does not, as is usually the case with the latter, change colour, but retains its original creamy-yellow colour throughout. This peculiarity is most noticeable, and we may say that the style of negative thus produced is the most perfect imitation of a wet-plate negative of the highest class that we have ever seen. The image shows up distinctly as a positive—a rather unusual occurrence with ammonia-developed dry plates—and when viewed by transmitted light presents the same appearance as an ordinary iron-developed wet plate. The film side also exhibits the well-known "peach bloom" so highly prized in connection with perfect negatives.

But here we must state what we have to say on the other side, lest our readers should jump at the conclusion that the success of the developer is already assured. The chief advantage claimed for it by M. Sammann is that it permits a very prolonged application without danger of fog. As regards fog, as usually met with under such circumstances with the ordinary alkaline developer, this is, perhaps, true enough, for, provided there be no free sulphurous acid or sulphides present it appears almost impossible to fog a plate in the strict sense of the term; but we have been unable to prevent the formation of a slight veil or bloom over the whole surface of the plate almost immediately the developer is applied. It is, however, only apparent on the surface of the film, and is practically unnoticeable by transmitted light, scarcely interfering with the brilliancy of the image when viewed from the back as a positive. Curiously enough, though this veil makes its appearance at an early stage of the development, it does not seem to gain in force as the action of the developer is prolonged, the negative retaining all its transparency in the shadows no matter how long the solution is allowed to act. It is possible that this defect, if such it can be called, is a peculiarity due to the particular sample of emulsion we have been using.

A more serious difficulty lies in the fact that up to the present time we have been unable to push the intensification beyond a certain point with the hydrosulphite and pyro. alone. We do not attach very great importance to the power of obtaining printing density with alkaline pyro. alone, having a preference for silver for intensification; but it is important that the first developer should give a certain amount of density or the silver cannot afterwards be laid on with facility. In this respect the hydrosulphite is difficult of management; for, after a certain stage is reached, dependent upon the length of exposure, no prolongation of the action seems to advance the density at all. It is not to be supposed, however, that the different grades of tint develope to a uniform shade, for the range of half-tone remains perfect; but the action of the developer appears to cease as soon as it has converted the portion of the bromide acted upon by the light and not to exercise any cumulative effect as is done by ammonia, though detail will continue to appear after the lights have ceased to acquire strength.

This would be a valuable property if it were only possible to augment the density of the image by other means, which we have not, so far, been able to do with facility. Silver intensification may be used; but it is a laborious operation, and the result at best unsatisfactory. This difficulty may, possibly, disappear when the conditions of the developer are better understood. We are continuing our experiments in this direction, and hope ultimately to be successful; for we believe, from what we have already seen of the method, that if the difficulties can be surmounted it will form a better and more easily-managed developer than the form in use at present.

In conclusion: we may sum up the process in a few words. The development is easy and regular; no danger need be anticipated of abnormal action; the deposit is fine in texture and the image of the highest quality, the only weakness being a difficulty in obtaining sufficient printing density, though it may be said that the colour is particularly non-actinic and presents an appearance of greater thinness than is really the case. It will be remarked that we have made no mention of the comparative sensitiveness exhibited by plates under this form of development, as this is a point we have not yet had time to study sufficiently.

ON FADING AS INFLUENCED BY DAMP.

In the course of the discussion on carbon printing, at the last meeting of the Photographic Society of Great Britain, some observations were made upon the alleged advantages of giving prints a protective coating of collodion to serve as a varnish to preserve the image from atmospheric influences, and thus prevent the fading of the picture.

We need scarcely remind our readers that a great deal of prominence was given to this subject several years ago, mainly through the instrumentality of the South London Photographic Society; and notwithstanding the plausible statements enunciated in support of this application, and the individual expression of belief that the fading of photographs was thenceforward to be considered a thing of the past, the fair promise thus held out was not destined to be realised, and this use of collodion was abandoned with even greater alacrity than it had been adopted when it became known that collodion had in some instances not only not arrested, but hastened, decay.

A letter which is published in another column indicates a source of fading which at the present time should command the attention of photographers generally. We say "at the *present* time" because of the unusual quantity of moisture and dampness which now prevails. The writer of the communication referred to forcibly directs attention to the influence of damp upon the permanence of a photograph exerted through the instrumentality of the paste by which it is attached to the mounting-board.

That starch, gum, and other substances of a similar character become affected by moisture to a serious extent is a fact apparent to many. Out of a number of microscopic slides mounted with the usual ornamental paper covers and placed in a cupboard which happened to be damp several have become much affected by a fungoid growth springing from the gum employed in mounting some of the objects; and it is worthy of notice that in no slides is this fungoid growth discernible except in those which were subjected to damp. The acidity engendered in gum after being kept in a wet state for even a short time is well known to photographers.

But it may be said that gum is not much employed for mounting photographs. True; but freshly-made starch and paste are used most extensively for this purpose, and these too, under favouring conditions, absorb moisture and putrefy quite as rapidly as gum. The last-named substance will prove quite as safe an agent for mounting prints as any other that can be employed so long as the picture is kept in a dry atmosphere; but, both in the case of gum and starch, it is the acid generated by moisture which acts with such fatal effect upon the image. If the conditions be suitable the process of fading will have been set up in a week after the picture has been mounted; but this is a condition that seldom prevails in ordinary practice.

One way in which a protecting film of collodion may prove beneficial will be the influence of the alcohol and ether upon the mountant. The action of these is decidedly antiseptic, as recognised by all who add alcohol to their solutions of gelatine to be used in mounting, this being added for the purpose of preserving the gelatine previous to use. However, antiseptics are energetic in their action both after as well as previous to the use of the paste or other mountant with which they may be mixed; and this being the case it will be advisable to make use of them as fully as possible. Carbolic acid, creosote, camphor, various essential oils, and other substances, as well as alcohol, are all powerful antiseptics, and the presence of a very minute proportion of some of these will prevent the decay of the substance with which they are mixed.

In the direction here indicated will be found the means of preventing the fading of silver prints from at least one source of such evil, namely, the decomposition of the paste by which it is cemented to the cardboard mount. We are only to well aware that the "antichlor" is not always eliminated from cardboard mounts. It need scarcely here be remarked that the hyposulphite thus lurking in the card, dormant so long as it is dry, starts into fatal activity as soon as it is prompted by damp and is allowed to remain in a moist atmosphere for any length of time. In this condition it lends its powerful aid to the acid paste, the result being the rapid destruction of the photograph.

EDINBURGH PHOTOGRAPHIC SOCIETY'S EXHIBITION.

[Third Notice.]

Since our last notice of this Exhibition the awards of the Judges have been published, and public attention has been for some days specially directed to the prize pictures.

Naturally the works of Mr. A. Kareline, of Nijnii-Novgorod, Russia, who gets the gold medal, come in for the greatest share of attention, and they will well repay whatever amount of study they may receive. He exhibits very largely, and all his pictures are characterised by a bold breadth of treatment and a wonderful facility in the management of light—qualities equally apparent whether the subject be a single figure study or a large group. The picture to which the gold medal has been awarded is a group of two—portraits of Mr. and Mrs. Zelenetzky (No. 775)—and seems at first sight a rather simple composition. The figures are seated near the corner of a room, the only furniture visible being the chairs on which they sit and a small table partially hidden by them. The only apparent source of light is a window draped with white curtains, and in the play of light and shade on these curtains lies one of the principal charms of the work. The difficulty of truly rendering white in shadow is well known, but here it is done to perfection. Like the majority of the artist's works, this is taken in sunshine. The gentleman is seated with his back to the window, and the difficulty of properly arranging the hand is skilfully overcome by his holding a cup, and there being a companion cup on the table the fact is indicated that the couple forming the group are enjoying a leisurely chat over tea. The lady is seated facing the gentleman and holding a large, partially-opened album resting on her knee, with her face looking out of the picture, while she is in an attitude denoting close attention. The picture contains few deep shadows; there is, however, no lack of brilliant contrast between the middle tones and bright touches of most dexterously-managed sunlight. But, as we understand that one of the Judges, Mr. Norman Macbeth, A.R.S.A., is preparing a paper on Mr. Kareline's works, to be read at a meeting of the Edinburgh Photographic Society, we need not at present pursue the subject further.

Resuming the notice of the various classes for which medals were offered, we come to portraits from 8½ × 6½ to 15 × 12. Of these there is a considerable display. Herr Kozmata, of Budapest, shows two fine specimens. His portraits of children (Nos. 407 and 411) are exquisite studies. They are each single-figure subjects—one figure half reclining on a couch, the other sitting on a chair, both being in night habiliments. The artist has wisely discarded the often questionable aid of accessories, and trusts to simple treatment and well-balanced primary and secondary lights for the production of most charming effects. Whether regarded as figure studies or as simple portraits these pictures are well worthy of the attention which they receive.

Mr. Annan, of Glasgow, sends a series of portraits of the professors in the university of that city. Probably one of the best—both as regards subject and treatment—is that of the late Professor Rankine (No. 759). Seated in academic robes, with a book on his knees at such an angle as to complete the composition, the massive head, with its profusion of rather uncontrollable hair, is lighted mainly from the top, and, while the deepest shadows are full of delicate detail, the play of the high lights is very satisfactory wherever the latter fall.

Mr. J. Moffat, of Edinburgh, also shows well in the same style. His frame of twelve well-known public men (No. 463) fully deserves the place it occupies on the line in the "great room." His portraits —like those of Mr. Annan—are all toned to a rich black; and, although they bear evidence of considerable retouching, it has been so judiciously done that the character and individuality of the sitters have not been sacrificed. The portraits of Professor Sir Robert Christison and the late Rev. Dr. William Arnot are specimens of high-class work in this department, both as regards posing and lighting.

Mr. J. M. Young, of Llandudno, exhibits one very charming example of what can be made of white drapery, and quite deserves the recognition he has secured. His *Hide and Seek* (No. 457) is an attractive picture of a lady gracefully posed, and partly hidden by heavy curtains, the folds of which give form and *verve* to the composition. The indication of modelling is, perhaps, a little too prominent; but the expression of the eyes is perfect.

From M. Dupont, of Brussels, there has come a frame of six portraits, very varied in style, but all excellent in quality. The treatment is somewhat Rembrandtesque; but, with the exception of portrait No. 2, the shadows are full of detail and the results effective. Especially beautiful is No. 4, in which the gauzy veil is charmingly rendered.

Mr. Nesbitt, of Bournemouth, is well represented in his picture *How Does it Go?* (No. 37). In this work a lady is apparently trying a new piece of music at a piano. There is an easy gracefulness in the position and an absence of all appearance of the model which, notwithstanding its somewhat unpleasant brown tone, makes this a popular picture.

Messrs. Taeschler Brothers, of St. Fiden, show a large number of fine single-figure studies or portraits of ladies and children (Nos. 13 and 14). In all these pictures the backgrounds are peculiar, being a combination of the natural and artificial, and evidently the result of double printing. The prints are in carbon, quite free from gloss, and the composition and general treatment indicate a high degree of artistic and technical ability.

In the course of a few recent trials with the moist emulsion process we have had an opportunity of studying the effects produced by different organifiers, and find that the variations in the results obtained under altered conditions are more considerable than we had previously thought possible. For instance: we find that sensitiveness is affected very materially by the nature of the organic substance employed, and, if the plates require to be kept for any length of time before exposure, the different alkalies modify the sensitiveness in a very marked manner. The proportion of glycerine, or hygroscopic matter, affects sensitiveness to a slight degree, and also extends its action to the density of the image. This is, most probably, entirely owing to its mechanical action in keeping open the pores of the film; for the glycerine itself we have always found to be chemically neutral, though Mr. M. Carey Lea asserts that under such circumstances it plays the part of a retarder. The organic substances employed were gelatine, albumen, gum arabic, dextrine, and the mucilage obtained by boiling linseed. In point of sensitiveness we place them in the following order, the conditions being, as nearly as possible, similar in every case:—Gum arabic, gelatine, infusion of linseed, dextrine, and albumen; while for vigour of development the linseed headed the list, followed by gelatine, albumen, dextrine, and gum arabic in the order named. It will thus be seen that both gelatine and linseed excel albumen in both respects; gum arabic, though extremely sensitive, is objectionable for various reasons, chief among which are its tendency to loosen the film, and, if the plates are kept long, its liability to decomposition. To make the infusion of linseed take a teaspoonful of the seed and wash well in cold water to remove dirt, and allow to soak for half-an-hour; then pour off the cold and replace it with a pint of boiling water, and allow it to infuse for another quarter of an hour; filter carefully and use warm. The gelatine, also, must be used warm, as the three-grain solution we employ becomes partially solid when cold. With regard to the varying action of the alkalies, this is only noticeable in plates that have been kept for some time, but it is not on that account of any less importance. The fixed alkalies vary but slightly, and that chiefly in the colour of the deposit, while it is immaterial whether the plates be used at once or kept. With ammonia, however, the sensitiveness gradually diminishes; hence for field work it is advisable to substitute a fixed alkali—preferably carbonate of soda. The proportion of hygroscopic matter is ruled by special conditions; hence it can scarcely be taken into the calculation in striving for rapidity.

A NEW DRY PROCESS.

A new dry process which, in some respects, is similar to the gum-gallic process of Mr. R. M. Gordon, although in matters of detail it differs very materially from it, has recently been published by M. Boivin in *Le Moniteur de la Photographie*. The author recommends that the plates should be cleaned with soda or potash and washed in several changes of water, after which they are coated with a mixture of whiting and water. The success of dry plates, in the estimation of M. Boivin, depends on their being cleaned with an alkali, while that of wet plates depends upon their being cleaned with an acid.

When a plate is about to be used the whiting must be wiped off with a piece of white cloth, which should be kept for the purpose, after which it is coated with the following preparation:—

Albumen	1 ounce.
Water	2½ ounces.
Ammonia	20 drops.

This must previously have been beaten to a froth, allowed to subside, and then carefully filtered. After complete desiccation the albumenised plates are kept in boxes for further use. The plates having been coated with collodion—old by preference, or two-thirds new and one-third old—are sensitised by being placed in a silver bath composed of the following:—

Water	1 ounce.
Nitrate of silver	35 grains.
Acetate of lead	8 ,,
Acetic acid	a few drops.

M. Boivin considers it highly advantageous to expose the bath to a full light for some time, and then to filter it before use.

After sensitising, which is complete after the plate has remained in the bath for three minutes, the plate should be washed—first, in slightly-acidulated water, and then in clean rain water. Coat the sensitive plate with, first, a ten-grain solution of phosphate of soda, then with a three-grain solution of gallic acid, and, without washing it, coat it with the following preservative:—

Water	1 ounce.
Dextrine (pure)	40 grains.
Gum arabic	9 ,,

After heating this mixture add a few drops of acetic acid and then filter through paper. The plates are now dried, when they will present an even film. Plates thus prepared will retain their good qualities for at least a fortnight.

The time of exposure depends upon the lens employed; for example, with a quarter-plate landscape lens the exposure will vary from ten seconds to one minute.

With regard to development of the image: immerse the plate—first, in pure cold water, and then in lukewarm water, and after washing in this manner submit it to the following developer:—

Water	3 ounces,
Gallic acid	5 grains,
Pyrogallic acid	2 ,,
Acetic acid	20 minims,
Alcohol	20 ,,

in which the plate is placed; and then add to the solution a few drops of a solution of phosphate of soda (ten grains) and a few drops of acetate of lead of the same strength. After a few minutes take the plate out and add a few drops of a solution of nitrate of silver (ten grains). When the plate is replaced in this solution the image will not fail to appear with all the details. More nitrate of silver can be added until the required intensity is obtained. The plate should be fixed with a solution of hyposulphite of soda.

Having given the foregoing details of operation, M. Boivin next proceeds to make some observations on the theory of this process, premising that during the last summer he was enabled to obtain very fine negatives of trees. He says the first coating of albumen is applied to the plate for the twofold purpose of absorbing the iodine liberated by the action of the light, and making the collodion adhere to the glass. The acetate of lead in the silver bath acts in the same manner as acetic acids for preventing fog, but with this difference—it has no retarding action. The effect of exposing the bath to light is that all the organic matter which frequently produces fog in dry plates is reduced.

The phosphate of soda used after sensitising has the effect of transforming the remaining traces of nitrate of silver into phosphate of silver, which is highly sensitive to light. Gallic acid acts an important part; it produces a greater degree of sensitiveness.

The preservative varnish protects the iodide of silver from the action of the atmosphere, while it also absorbs (like the albumen) the iodine liberated during exposure. This preservative varnish is very easily dissolved by washing in hot water. It also enables the developer to exercise its full powers upon the sensitive layer.

The action of the developer is greatly assisted by the addition of phosphate of soda and acetate of lead.

SPOTS ON PRINTS.

Of all photographic ills the spot plague seems to be the worst to bear and the least understood. Many fine days' printings have succumbed to its ravages. Notwithstanding the amount of discussion and liberal treatment it has received, this great bane is constantly cropping up in various printing-rooms in one or other of its many phases, if the experiences of poor unfortunates that periodically pour their grievances into these pages are to serve as an index. That albumenisers are alive to its prevalence is evidenced by the recent articles by Mr. J. Skinner. No sooner is one species successfully explained away before another appears, and for a time holds sway.

During the past year spots—blue, white, and sickly-looking—broke out among my prints. This being their very first appearance in any shape among us, I was completely at a loss to divine their cause. "It's the paper," cried the printer. "No! it is the sensitising," muttered the toner. "It must be the washing," feebly whispered the mounter. The spotter said nothing; "his heart was o'ercharged to express." The young apprentice (safe in innocence) ventured with some of the worst to the principal. Then and there was hurrying to and fro. "Who mixes the silver?" "Has anyone been inventing anything?" Questions like these were rapidly asked and as rapidly disposed of, resulting in the despatch of a telegram for different paper.

For a while all went well, till the sample lot was used and a new ream opened. "Any spots?" were the words that trembled on my lips next morning. "Just the same," was the dreaded answer. Time went on, and various theories were mooted and freely discussed. "It's the spray sparkling on the prints directly they are placed in the trough." "No; it is that new sensitising room. Something comes from the plaster and spoils the paper." This last seemed indeed very feasible, for I was well aware that a newly-plastered room, for evident chemical reasons, is not the place in which to dry sensitised paper. For a while this put me off the right track, till, getting the same spots on resorting to my old room, I proved it was not the cause.

I then determined at every printing to use, principally, paper that had never troubled me, along with pieces of paper spotty, previously-marked, and prepared and finished in different ways.

Then—" 'twas passing strange"—do what I would, not a spot could be produced. This was rather annoying. All my tests of course went for nothing. This was the case during some very dull weather, with fewer prints than usual, which gave me the first glimpse of the cause of the trouble. Directly the weather changed and the number of prints increased the spots broke out. The question now arose—"What was the difference in treatment of a small and a large batch of prints?" It was then I came to the glaring fact that the paper received from a well-known, old-established firm could not survive even a couple of minutes over a certain time of immersion in the hypo. solution. The largest batches of prints were, in my practice, left a little longer in the hypo. than the others, and this was found to be the cause of the spots. If prints from this particular paper (which probably is now in general use) remain in the hypo., say ten minutes, no spots will result; but give two or three minutes' more immersion and spots will appear while in the washing trough, and with a still longer immersion they will gradually gather while looking at them in the hypo.

While recognising the great importance of the fixing of prints (which ought to be as accurately gauged as any operation in photography), there is no reason why such penalties should ensue by overstepping the time of immersion, and albumenisers should see to it that no paper is sent out but that admitting of some latitude in this respect.

Thomas M. Laws.

LIGHT, EXPOSURE, AND DEVELOPMENT.*

Exposure *(continued)*.

And now I will direct a few remarks under this head to portraiture. The time at which to expose is a point quite as important in portraiture as in landscape photography. Of course it is well known that in the interest of the plate the exposure should be commenced as soon after it is put in the dark slide as possible; but there are also other matters to be equally well considered. I have always found that it is a good thing to allow the sitters some time to look at specimens, and stroll about the studio or place of sitting, as that allows time for their nerves, heart, and muscles to get more composed after their walk or ride. Persons generally indulge on their way in such thoughts as—"How shall I look?" "I wonder if this sitting will do?" "Will my friends like it?" &c., &c. Now, by giving them a number of interesting photographs to examine while you prepare, their imaginations and temperaments get generally a little more calmed, and the chances are much more in favour of a good picture. Should a friend be with the sitter I see no need of excluding him or her till you are about to pose; but immediately upon that, without any exception, I would urge that no one be allowed in the studio but the sitter and yourself. Prior to posing it is a good plan to get your camera focussed pretty nearly to the distance required, as every unnecessary motion during posing tends most materially to tire the sitter. Having arranged the sitter it is advisable to expose as rapidly as possible and without delay; and now will be felt the benefit of having no other petty matters to attend to, distracting your own and the sitter's attention just at the most inopportune moment. Having next to nothing to do after posing but to expose, the time that the position and the facial expression is required to be maintained is reduced to a minimum.

There is one thing I would strongly deprecate: it is the custom of asking your sitter to "please look at that"—perhaps a mark, crack, or dirty mark on the wall. Or "keep your eye towards that corner"—very likely the visible abode of a miniature *tarentula.* Should you know that you are photographing a married lady, have a pleasing little coloured print or picture of a pretty child, &c. With a few different little framed subjects or models for placing in different parts of your studio almost every sitter may have something agreeable to look at, and this is a matter greatly affecting the ultimate expression in the negative. It is not the most easy thing to continue cheerful and happy-looking while regarding fixedly a brass-headed nail or a single painted eye peering at one, which latter I saw in a professional studio once. From the moment the posing is completed everything coming under the notice of the sitter should be pleasing and free from constraint if a pleasant expression be desired.

Immediately the lens is uncapped the operator should at once, by the sound of his feet, let the sitter know he has retired a pace or two and that his eyes are not upon him; and, above all things, never let the sitter keep his eyes fixed till you are about to uncap the lens.

I will now say a word or two on *How to Expose.*—For views I maintain that always, if practicable, *a long exposure and weak developer* give far the best results. I am of opinion that when a strong developer is used there is a much greater likelihood of hardness, and as a strong developer requires a quick exposure I do not think that such detail is secured as with a long exposure; that is to say, in taking, for instance, the case of a landscape with fairly-lighted parts, and also very dark portions in the depths of the foliage, presuming a short exposure be given and a strong developer used, I believe that the well-lighted parts assume a certain degree of hardness, and the dark portions of foliage do not contain so much detail. But suppose we use a weak developer and give a long exposure, the details in the deep shadows get a longer time for impression on the film, and can be brought out slowly but surely by building up the negative, at the same time the weakness of the developer prevents any hardness in the well-lighted parts. But some may say—"If you give a short exposure your developer is in accordance with it, and so the results should be equal." Theory may assert so, but I most decidedly affirm that theory in that case is false, and does not, as a matter of fact, harmonise with practice and result. The picture on the table labelled No. 3 had seven minutes' exposure, and was developed with a weak developer; that is to say, about twenty grains—five grains more than I generally use—the subject being a remarkably dark one.

In making exposures there is one thing that should be continually studied. It is to endeavour to gain a tolerably accurate idea of the actinic power or value of different colours in nature, such as the light and dark greens, browns, greys, yellows, and reds. This can only be acquired by carefully noting the exposures and examining afterwards the negatives, carrying the landscape in the eye as well as possible. By so doing a far better idea of the required length of exposure is obtained than by any other method I am acquainted with. We cannot rely on apparently equally-lighted subjects, or recollecting the exposure of one subject and applying it to another. What appear to be equally-lighted subjects are very often not so By making this a little point of study many a negative will be saved from under-or over-exposure. Again: if the subject be any considerable distance from the tent, never should the wet blotting-paper at the back be omitted.

In a great number of cases a mistake is made as to the manner of uncapping the lens. We will suppose that the view comprises foreground, sky, and one of the sides of the picture in shadow. In uncapping the lens the foreground and dark side should be exposed first, the sky being exposed last. If the dark side of the subject be on the right you would uncap the lens diagonally, beginning at the lower right-hand corner and coming gradually across obliquely, the effect being that the foreground and dark side would be the first to act on the sensitive plate; and so on, later and later, until you come to the sky. The cap should be replaced in the same manner, only *vice versâ*, beginning where you leave off. What often affords the greatest difficulty is to get well depicted a prettily-clouded sky, and yet well expose the other parts of the picture. A most ingenious and useful piece of apparatus for effecting this object is a new kind of sky-shade lately introduced, with finger-like projections, which can be lengthened or shortened to follow approximately the outline of the sky, so that prior to exposure the sky can be shielded, and after half or more of the exposure has taken place the shade removed and the sky exposed. I have never used it, but have been told very fine cloud effects can be obtained in the negative by its help; but I have attained somewhat the same end by using the cap of the lens judiciously in a similar manner.

Relative to life in a picture: a little often adds greatly to the naturalness and reality of it, but I do not like to see it introduced as a sort of habit. This is one more point which must be left to the operator's discrimination and good judgment.

As to how to expose for portraits, I will just make a remark or two; but I will not say much, as far more able pens than mine have written as to this, and I fear I have already tired you. One point that is very important is the position of the camera, which, if not carefully arranged, may ruin an otherwise good picture. If the camera be too high, so that it requires to be greatly depressed to embrace the subject, the effect is to give an entirely wrong impression of the pose, causing the head to appear as held down, and showing far too much of the top of it. On the other hand, if the camera be so low as to be pointed upwards to the sitter, the consequences may be very disastrous and far from flattering, producing the effect of a turned-up nose in an aquiline, distorting the chin, and giving the impression that you are peering up underneath the chin, nose, and eyes, the effect being ludicrous and truly horrible. I think it will be found that the best position for the camera is a little above the level of the sitter's eyes for three-quarter length figures, and a shade lower for vignettes.

There seems to be a rather prevailing opinion that portraits taken with direct sunlight effects are quite out of the question and not to be thought of. If more photographers would occasionally produce such, providing they be artistic, I think I can safely affirm that they would become to a certain extent popular. I have seen some most excellent pictures with such effects. One was taken by a friend of mine in which the sitter, a gentleman, had on a straw hat. The sun was in such a position that it cast a sharp, moderate shadow round the face, the straw hat entirely protecting the eyes from the sun's rays. There was full detail and yet a most charming sunny-day effect of an extremely pleasing character. But of course the same thing may be done with good taste and judgment, and without any; in the latter case I can imagine a shocking effect. But they may be made with such a style of lighting very pleasing and attractive, without one atom of harshness; and I would recommend some of the members next season to try it.

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* Concluded from page 19.

I would while in this section state my belief in what has been much discussed, viz., supplementary exposures to yellow light. I have found it more than once an assistance. No. 4 is an instance. That picture of a horse—a colour, by the way, not conducive to short exposures—was taken on a very dull, rainy, autumn day, with an exposure of a little over three seconds, which of itself could not possibly have been enough; but I placed it close to my tent window for three minutes, and the result was successful. Of course the picture is not all that might be desired in all respects, but it is just what would be expected on such a day. I will now pass on to my third and last subject, viz.—

DEVELOPMENT.

From what I said at one point of my foregoing subject you will remember I strongly oppose for general outdoor work a strong developer, believing that a fifteen-grain solution is by far the most capable of giving soft and harmonious results when used after a proportionately long exposure. The developer I use is very simple and decidedly not new, the proportions being—

Ferrous-sulphate	½-ounce.
Acetic acid	¼ ,,
Alcohol	½ ,,
Loaf sugar	½ ,,
Water	8 ounces.

This I make up of quadruple strength in considerable quantities that will admit of keeping, and dilute as I require it for use. I daresay all present know this formula, but I give it in case any should not. The sugar gives a certain flowable thickness to it very valuable. I have lately used the collo-restrainer or collocine made by Messrs. Wratten and Wainwright, and am very much pleased with it. I am not at all sure that I shall not always use it; it has the power of restraining fog, consequently enabling the development, if necessary, to be pushed farther than without its use, and as a result the shadows are very clear and free from any deposit.

There is one thing I have noticed during the process of development which I should like to bring before your notice. Presuming you have just flooded the plate with the developer the picture commences to appear, and up to a certain point increases in detail and depth more rapidly than after. Now up to that point I always keep the plate rocked backwards and forwards, so that the developer is in motion; but directly that point is attained I pour off the developer and leave it off for (say) ten seconds, and I find invariably that during those ten seconds the development continues much more energetically than it would have done during the same period had the developer still been kept on. I then pour on the developer again and finish the operation. I have so often—I may say invariably—noticed it that to do so is now quite a matter of habit. I have developed without doing so more than once to be quite confirmed in my belief, and am perfectly certain that between the times taken in development by each method there is a very considerable difference; and I am not prepared to affirm that the final results are not different. I have not been able to explain the theory of this, and hope it may be a point for after-investigation and discussion.

Relative to instantaneous pictures: I know it is the belief of some that a developer of the normal strength—say fifteen grains—may still be used with perfect success, the only difference in treatment between ordinary and instantaneously-exposed plates being that the latter picture can be fully developed by continuing the development longer with fresh supplies of stronger developer, and so building up the picture. Now, although this appears somewhat akin to my idea as to weak developers, it differs in this way, namely, that with an instantaneous picture the exposure is not proportionate, and so, although I may be wrong, I differ from it. I believe that the effect is entirely different if the plate be *at first* flooded with a strong developer, and that the development is much more complete and satisfactory on finishing than with the former method. The whole action of the development seems far more energetic and continuous with the immediate application of a strong developer; and I believe that a less exposure can be given with this method, as when using the ordinary developer the action seems to come to a standstill much earlier.

I should not speak so confidently on this point had I not done a considerable amount of instantaneous work in taking the steamships of the Great Western Line, between Bristol and New York, as they steam past my house; and which is certainly a fair test of instantaneous work, to which class my more recent remarks have exclusively referred. For this class of work I am now making a rather new kind of instantaneous shutter with one or two original improvements upon the old form, and which I hope to exhibit at one of our meetings during the session.

If it would interest the members I will give my mode of developing a wet plate that has been kept a long time. After I return to my dark room or tent I commence development by flooding the plate with what I term "diluter." It is the iron developer I have given *minus* the sulphate of iron. Before doing this I add ten drops of the developer to it; this is then so weak that it is got over the plate with perfect ease and without the slightest fear of stains, it having too little strength to set up any action worth speaking of, and even that not for some time. After it has thoroughly remoistened the plate I pour it back into the developing glass and add an equal quantity of double-strength developer, which makes it of the normal strength. It is then poured on the plate and the development proceeded with as usual.

And now I have but one more matter to speak of, and that is the question—Why do amateurs do so little outdoor work in fine frosty winter weather? It is true that, of late, perfidious Albion has possessed very little fine winter weather; but when it *does* come many more beautiful studies of snow scenes might be obtained than are. There is no reason why the coldness of the developer should remain an obstacle. While erecting your tent place a saucer of water or a shallow dish over a small spirit lamp in one of your boxes, so that the lamp may be protected from the wind, and place your bottles to stand in the dish. The solutions will soon attain a temperature of about 65° or 70°; then place them in the tent, also the small lamp. The air inside the tent will soon be nicely warm, thus keeping the solutions and making the bath warm. You can put your lamp out while operating and re-light it while exposing, and so keep a little oasis of summer in the midst of a vast winter.

And, now, I thank you for the patience you have exhibited in listening to my paper, much of which I fear is worse than bad news, namely, no news; and which, though I have tried to compress the matter of it as much as possible, has, I fear, almost exhausted your patience. Still, if any portion of it has given information or useful hints to even a few present, I shall feel very glad and amply repaid for any trouble I may have taken. H. A. H. DANIEL.

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ON THE SPLITTING OF NEGATIVE FILMS.

THE splitting up of a varnished film is frequently the source of considerable loss and annoyance to the photographer prints from whose negatives are in constant demand. In some cases it is not only a matter of serious hindrance, but also of absolute loss, if a duplicate be not at hand, or when it is impossible to retake the picture. Damp and variation of temperature are frequently the exciting causes of this particular damage, and the facility with which some negatives succumb to these influences and the absolute immunity of others indicate the necessity for the investigation of those causes that prevent or accelerate such breaking up, with the view of taking those precautions which will render our stocks of negatives as permanent as possible.

From various opportunities I have had of investigating this matter, I am inclined to attribute the primary cause to the collodion used more than to anything else. If the collodion be of an adherent nature—as many of the commercial samples are—almost any varnish in ordinary use, and no very great care in storing, will retain the negatives in good condition; but if collodion of a contractile character has been used—each as easily leaves the plate during sensitising or development, unless special means are adopted to retain it in its place—splitting of the film is almost sure to occur, whatever care may be taken. I have seen negatives that have not been printed from for a year after being made, but which were stored with the protection of a piece of soft paper between them in a dry, cool room, being then perfect, split all to pieces after being put to press in cool weather in less than a day.

Negatives must be sufficiently permanent to bear considerable variations of temperature, heat, and moisture, as the ordinary exigencies of printing involves this, as in most businesses printing is conducted both in and out of doors. It is interesting and useful to ascertain the different conditions that favour the occurrence of these defects, and likewise the conditions that give us the greatest immunity from them. Whatever kind of collodion and varnish be used, excess of damp, cold, and heat will cause their disintegration, and sooner or later negatives will under these conditions break up, but in different ways; and the differences will indicate the substances at fault.

The form in which the splitting occurs is very characteristic. If the collodion and varnish be of the ordinary average of commercial quality—which I think I am justified in saying is good—the cracks caused by climatic influences will be angular, and the film will remain almost, if not entirely, unaffected and attached to its supports in every part except that occupied by the cracks; but, when splitting occurs from the inherent fault of the collodion, the cracks will be found of a wavy character with no sharp angles, and the *whole* of the film is loosened from the glass and easily removed by slight rubbing. I need not say that this is by far the most dangerous fault.

Splitting of the film from whatever cause is to be prevented if possible, for not only do the cracks themselves need repair and involve much work or touching on the finished proof, but the silver from the sensitised paper will gradually insinuate itself beneath the film, and in course of time utterly destroy the negative by staining it all over. No method that I am aware of will remedy this. The exceedingly tender condition of the fim is also a source of much trouble—scratching with a touch that should not do any damage; in fact, the surface of such a negative is more easily injured than an unvarnished dry plate, or a wet plate protected only by a coating of gum arabic.

I have seen negatives kept—or, more correctly speaking, left to take care of themselves—for years in damp rooms in boxes and parcels, perhaps not moved for months together, and yet have shown no signs of cracking except in one or two instances. These negatives, I happen to know, were made with a tough, adherent collodion, and varnished with a cheap commercial varnish. I have at the present time many negatives that have been kept in various unsuitable places, according to the general ideas of suitability, without suffering any injury, and only protected by being wrapped in parcels of about a dozen each with a piece of paper between them. They were made with a collodion that would adhere well to the glass, no particular precautions being taken with them.

This matter of splitting of negative films is well worth serious attention, and the experience of many photographers may corroborate or disprove the opinions I have expressed. At anyrate, the cause being definitively ascertained, means of prevention will probably suggest themselves. EDWARD DUNMORE.

ON THINGS IN GENERAL.

AMID a glorious crowd of *fiascos* the chronicle for the past year closes with a trio of processes, any one of which would appear important enough to be considered a proof of progress if individually associated with the annals of the past twelve months. I allude to the moist gelatine process, the moist emulsion process, and the very remarkable and important discovery of Captain Abney with regard to the double film. The question of wet *versus* dry is so old that little remains to be said which can show an impress of novelty, and it requires no argument to prove the desirability of a moist process of complete trustworthiness. When a professional photographer is commissioned to go from home to make certain pictures he must use all his ability to obtain not only excellence but certainty. We all know very well that, practically, in wet-plate work we generally hit the nail upon the head with each plate we expose, first-class operators very rarely having to re-expose a subject; nevertheless, even with this amount of assurance, we should have a very poor opinion of a man who, having only one picture to produce, should only take a single glass with him. Photography, which has been not over-kindly called "the handmaid of art," is but a fickle jade at best, and we cannot afford the chance of being jilted by her when the stakes are reputation and lucre. So all hail to the new phases of dry-plate work! May they prove worthy of the hopes they have raised!

Of the Abney process—which, if it come, as most likely it will, to a practical issue—it is full early for me to speak; but there is no question that it points to results which may be of vast importance to our art.

In the same line with wet *versus* dry ought certainly to be placed retouched *versus* untouched negatives, as upon both these vexed questions a world of wit and words has been wasted, though I cannot say they remain "as they were." A great deal of light has gradually pierced through the cloud of verbiage that has surrounded them. They are fairly seen in their true colours, despite the occasional intrusion of accidental rays of a too brilliant description. Nothing I have read for a long time gave me such pleasure as Mr. Henderson's remarks at the meeting of the Glasgow Photographic Society, when the question of retouching was to the fore. It is now pretty generally conceded that it is simply a question of individual skill and judgment on the part of the retoucher. There are few once rigidly opposed to the method who have not silently acquiesced in the inevitable; and the most blatant advocates in former times of the photograph *pur et simple* are they who now make use of it to the utmost. If a man has a light touch, a trained hand, and an appreciative mind he can vastly improve the majority of negatives—at least such is my opinion. Consequently, when, in reply to the President's strictures, Mr. Henderson boldly stated that the talk of more character being observable in the untouched than the touched "was all moonshine," I at once administered to him a mental pat on the back. In these days of sham and veneer it requires some courage to put one's foot on the conventional jargon of pseudo art-criticism. (I here make no personal allusion whatever to the President.) I honour Mr. Henderson for it; nineteen-twentieths of the talk about "character" and "individuality" is a mere parrot-cry. It is an æthetic disgrace to any man to destroy the individuality of a portrait; but an artistic worker will not destroy it—nay, more, he will heighten it. Yet I grant that a great number who stipple and flatten negatives are not artists—born or made.

The committee of the Edinburgh Photographic Exhibition have put their foot upon retouching. Poor Mr. Gutekunst is not to have a medal because he has "modelled and retouched his pictures to a degree beyond that which obtains in other original and comparatively untouched negatives." I have only to say that the recipients of most of the portrait medals are noted for the ability and thoroughness with which they do retouch, and I could name one whose every picture is worked upon to a most exalted pitch.

The subjects of the Czar of all the Russians seem to have been very lucky at the Exhibition. This reminds me of a paragraph in the report of the Cologne and Rhenish-Westphalia Photographic Society, where it is stated, with respect to a very well-known Russian name, that "the meeting was brought to a conclusion after an explanation from Herr Creifeilds of the well-known Denier process." It may be well known, but I don't remember anything like an authoritative or complete description of it ever having appeared in the English journals. So I propose that the Editors get their foreign reporter to transcribe his notes in full.

Another foreign name occurs to me as my pen rambles along—that of M. Klary. He seems to have been "taking a rise" out of a brother photographer, which latter unfortunately would appear to have had, metaphorically speaking, to present himself before the bar of his Society's opinion. Herr Luckhardt received a letter from M. Klary asking his opinion of his pamphlet, to which the former replied that it expressed opinions in accordance with his own practice and theory; but there was nothing new in it, and he advised him to sell his writings as a book and not his instructions as a process. M. Klary publishes just as much of Herr Luckhardt's communication as suits his purpose, and throws the rest in the fire. Herr Luckhardt is rather surprised. Clearly he was not versed in the ways of process-mongers, but is now a wiser man.

My keen powers of scent smells another "process" in the wind. Five learned men (not the wise men of Gotham) went to Herr Winter's studio and there saw a picture exposed, developed, and finished in fifteen minutes. We are told the inventor of the method claims that these pictures are more chemically durable than the ordinary prints upon silver chloride paper. My experience is that very few enlarged silver prints are produced by direct printing, and the reduced prints here described seem to possess no element of novelty.

The greatest novelty I have seen is the complaint—in the "Answers to Correspondents" column—of a gentleman who feels aggrieved that no one will give him a fair price for his paper clippings until he has reduced them and found out what they are worth. Could it be believed that anyone would be so unreasonable? It is just such querulous objectors as this who have left their mark on the nitrate of silver question. Not very many months ago no end of letters were written to show how we were being defrauded by the nitrate of silver manufacturers—silver being a shilling an ounce cheaper and nitrate nothing altered. No consideration was shown for the manufacturers who sold the crystals at one time at a price which scarcely covered the market value of the metal contained in them. We are now reaping the reward of our ingratitude. Silver itself is still cheap, yet the leading firm of nitrate makers advise their customers that the present price is such as has never been reached for twenty years!

So the great Loan Collection is over and closed! Peace be to its ashes! It is difficult to believe it has not been a failure, yet the reports read vastly like this. An attempt is being made to make the collection permanent, which, says the *Athenæum*, is still struggling, though feebly, for realisation.

From the same source I learn that Mr. Thompson, F.R.G.S., in conjunction with Mr. Adolph Smith, is about to publish, through Messrs. Sampson Low and Co., a new monthly periodical, entitled *Street Life in London*, whose object will be to present to the reader some account of the present condition of the London street folk, and to supply a series of faithful pictures of the people themselves. Also in the same columns, in a series of inverted commas, were details connected with a new publication to be called *The Portrait*—a weekly shilling journal intended to illustrate the times we live in by means of photographs and memoirs of those who adorn and disgrace it. "Writers of ability and of known notoriety," says the prospectus, will be invited to supply their own memoirs, "which will not be charged for as advertisements." This last delivery is dreadful; it is too sarcastic.

Do all my readers know that the Royal Society has had placed in its hands, by a wise Government, the sum of four thousand pounds for the object of encouraging research? There is sure to be a fight over this pecuniary prize before it is, in whole or part, adjudicated. Now, why should not the great society which is supposed to be at the head of photography make an application for a share of this spoil? What a vast sea of research is open!—what discoveries to be made, and theories to be proved or disproved in the sphere of photographic physics!

The grand meeting and discussion which was held the other day under the auspices of the Photographic Society of Great Britain seem to have left the subject of carbon printing pretty nearly where the speakers found it. No doubt there are many who would like to have still another and another series of experiments, to enable them to work the carbon process without the expense of lessons; but the licensees are not to be drawn. At the same time an absurd face is put upon the matter when, under the cloak of instruction, long-winded, empty platitudes (that cannot indeed be said to be free from profanity when we see the sacred words of Scripture tagged on to them) are contributed with no effect but to uselessly swell the mass of mystery and verbiage with which so many are endeavouring to surround the question.

To return to the discussion proper. I found nothing to be learnt from it; all who might have been able to teach didn't—and very properly too, if they have secrets to keep. But I have a shrewd suspicion that everybody was in the fog, and that carbon printing is little or no nearer to supplanting silver than it was a couple of years ago, and that the vaticinations so freely indulged in will take some very considerable time for their fulfilment.

That Justice is rightly represented to be blind I could not help mournfully admitting after reading two legal cases in connection with photography in these pages a week or two since. A poor devil of an operator—who had charge of outdoor work, taking negatives, receiving moneys, and otherwise filling a very responsible post, all for a miserable pittance that a navvy would scorn—gave way to temptation, pocketed some of the cash, and got "three months" for it. I do not for a moment wish to excuse the moral turpitude of the act; but it was not an unlikely finale to a salary of twenty-five shillings per week, tempered by the munificent commission of half-a-crown if he did eight pounds' worth of work in a week. One could not expect that man to go in for "individuality" and "character."

The other case I noted was that of a disgusting fellow—one, I am afraid, of a too numerous class who bring disgrace on the profession by their gross behaviour. He was discharged from his post on the spot for attempting to kiss a young lady sitter—a perfect stranger to him. He had the surpassing effrontery to bring an action for wrongful dismissal. His only punishment was to lose his case and pay the costs. Which master suffered most, I wonder, by the acts of his servant, either in pocket or reputation?

FREE LANCE.

FOREIGN NOTES AND NEWS.

WEAKENER FOR OVER-INTENSIFIED NEGATIVES. — SIMPLE ENAMEL. — THE DRY-PLATE PROCESS IN AUSTRIA AND HOLLAND.

IN the *Photographische Correspondenz* Herr Riewel recommends repeated coating of the *dry*, not *moist*, plate as a simple and convenient method of weakening too dense or over-intensified negatives. His *modus operandi* is as follows:—He does not moisten the plate to be rendered transparent with water, as usually recommended, but pours equally, as in developing, over the perfectly dry plate a sufficient quantity of a very strong solution of cyanide of potassium, leaves the latter to act for a short time, and then pours it off; if necessary a fresh solution of cyanide of potassium is poured on, and finally washed well off. Should the picture, in spite of the repeated treatment with cyanide of potassium, still be too dense the experiment may be repeated, the plate being dried between each repetition. It is also advisable, for fear of washing off any of the film, to run a little negative varnish round the edges of the plate with a brush. This treatment will, of course, change the general tone of the negative from blue to yellow; but this Herr Riewel is inclined to consider rather an advantage than otherwise, as he, in common with many others, considers the prints furnished by such negatives superior to those from bluish negatives.

Herr Grainer recommends the following as a less troublesome enamel for photographs than that usually employed:—Place fifteen grammes of picked isinglass in a vessel, and pour over it as much good grape vinegar as will make it thoroughly wet. After a lapse of eight or ten hours add more vinegar, and continue to do so at like intervals until in from forty-eight to seventy-two hours the repeated additions of acid has reduced the whole to a pulp. To dissolve the isinglass completely boil this pulpy mass from half to three-quarters of an hour, adding hot water sufficient to keep the substance fluid, and about as thick as a somewhat thick iodised collodion. The fluid is now allowed to cool, and is poured into bottles to settle. When required for use a little of this isinglass solution is simply poured over the finished and mounted print, the excess poured off, and the picture left to dry. When dry the picture is polished exactly as the cabinet-maker polishes a table, and it is then ready for delivery to the customer.

Of late years the prejudice in the minds of professional photographers against the dry-plate process as a process only fit for amateurs has been gradually melting, as no reader of this Journal can fail to know. Indeed, so far has this favourable reaction gone—supported as it is by the admirable productions of Mr. England—that many now think that, if taken up in real earnest by energetic professional men for their landscape work, the process has a great future before it. Amongst the most recent testimonies in favour of the dry process Professor Simony's account of his last autumn's photographic tour in the slate regions of Germany, and a letter from the president of the Photographic Society of Amsterdam (Herr Haakman) to Dr. Hornig, of Vienna, may be cited.

The former gentleman had arranged to make this tour during the autumn holidays with an experienced photographer, who was to take views with the wet process simultaneously with Professor Simony taking dry-plate views; at the last moment, however, the latter had to start alone. He was well furnished with all the newest apparatus, including a camera by Jonte, of Paris, having four double dark slides; all the most approved chemicals; a number of ten-inch prepared tannin plates; and two Dallmeyer lenses—a rectilinear No. 2 for six-inch plates, and a landscape No. 4 for twelve-inch plates. Unfortunately, before setting out he had not had much practice in the manipulation of dry plates, though the results obtained exceeded his expectations. The camera and other apparatus he took with him, though exceedingly convenient, compact, light (the whole did not weigh more than six kilogrammes), and easily carried, he found scarcely substantial enough to withstand, for any length of time, the fatigue of mountain climbing. The plates, however, which were prepared in July and August, by Herr Burger, were as sensitive in October as when first prepared, and of the first thirty-eight plates exposed only eight were rejected as unfit for printing from, many of those retained being as good as wet plates exposed under similar circumstances. The failures Professor Simony does not ascribe to the process but to his own want of practice.

Herr Haakman—who is, however, not a professional photographer, though from the position he holds he may be assumed to know something of photography—writes in the same strain, and gives the following particulars as to his mode of working:—"I work principally with dry processes and almost exclusively with coffee plates; although I have got good results with tannin, tea, tobacco, morphia, &c., yet I prefer the coffee process. I prepare the plates as simply as possible. My coffee solution consists of—

Boiling water	100 cubic centimetres.
Roasted, unadulterated Java coffee	5 grammes.
White sugar in a little water	2½ ,,

The cold filtrate infusion is poured twice over the plate, and the plate is placed each time upon fresh blotting-paper to dry. These plates keep at least two or three months in summer, and are very quick. I prefer, however, to give a comparatively long exposure. I develope in a flat bath, pouring forty drops of a twenty-per-cent. solution of pyrogallic acid in alcohol into from 150 to 200 grammes of water. The dry, exposed plate is placed, collodion side uppermost, in this bath as in the silver bath. (In my hands, carbonate of ammonium in the developer often gave rise to the formation of spots, while plates developed in the foregoing water were quite clean and free from flaws.) In a few seconds the light parts appear, and when the picture shows itself almost completely I wash it under a rose, and intensify with a solution consisting of—

Water	180 cubic centimetres.
Pyrogallic acid	10 grammes.
Citric acid	½ gramme.
Three or four per cent. solution of nitrate of silver	2 or 3 drops.

This solution can be used for a series of plates, say ten or twelve, and need not be changed for every plate."

Our Editorial Table.

THE POPULAR SCIENCE REVIEW. No. 1. (New Series.) THE MONTHLY MICROSCOPICAL JOURNAL. No. 97. SCIENCE GOSSIP. No. 145. HOW TO CHOOSE A MICROSCOPE.

London: HARDWICKE AND BOGUE.

THE first of these serials, *The Popular Science Review*, makes its appearance this quarter under a new editor, Mr. E. W. Dallas, F.L.S. It contains, as usual, articles on topics of current interest. One *On the Arctic Expedition*, by E. G. Ravenstein, F.R.G.S., gives an excellent *multum-in-parvo* account of that expedition, illustrated by a map. An article *On Agates, and Agate Working*, reveals, in connection with this favourite stone, a good deal with which the public is unacquainted, viz., that the bulk of what is used in this country is imported from the continent, and that they are usually "sophisticated" to a wonderful extent, such sophistication consisting in altering the colours of the respective layers which form the markings that impart value to the stone. The onyx, sardonyx, and carnelian, that delight us by their fine colours, owe their charm, not to nature, but to the dyes and operations of the chemist.

The Monthly Microscopical Journal opens with a paper by the Rev. W. H. Dallinger, in which he seeks to show that *Navicula crassinervis, Frustulia Saxonica,* and *Navicula rhomboides* are only different names for one and the same object, and as this is of various dimensions it is, therefore, a most uncertain and unreliable *test* object. Among the other articles, one on *Microscopy at the American Exhibition* will be eagerly read by manufacturers of microscopes, and others interested in the construction of the instrument. The *Journal* contains a well-digested summary of the microscopic news of the past month, as well as of the meetings of several microscopical societies.

Science Gossip is stored with abundance of "food for thought" for the class to which it appeals, namely, "students and lovers of nature." In an article *On the History of Gourds*, Mr. Hampden G. Glasspoole quotes Pliny as alluding to certain medicinal properties possessed by wild gourds. We mention this because, two years ago, we found in the juice exuding from a gourd but little known in this country (a species of the *Hubbard squash*) a preservative for photographic plates much superior to anything we had tried during that year. When the fruit, or the fruit stalk, was cut there immediately exuded from the pores a clear fluid of a taste so astringent as to be suggestive of a concentrated solution of tannin. This when diluted and used as a preservative yielded negatives differing from those organified with either tannin, salicine, or pyrogallic acid. Our experiments in this direction were brought to a standstill by the failure of our crop of gourds the following year, six different kinds of which edible we had planted with a view to photographic experiment. The present number of *Science Gossip* is enriched with several illustrations.

How to Choose a Microscope is a pamphlet of thirty-two pages, containing much useful information for any person about to select an instrument. It is well illustrated, and is singularly free from the shoppiness that so frequently pervades manuals of a similar character.

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THE PHOTOGRAPHER'S POCKET ALMANAC.

D. H. CUSSONS AND Co., Southport.

THIS little almanac contains two illustrations, showing respectively a group of three figures posed upon the "photo-lectern" of the firm by whom the almanac is issued, and a group of accessories of a useful or ornamental description. The "text" fulfils the highly-useful functions of a price list, which may be studied with much advantage.

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IN THE TRACK OF THE TORNADO.

By F. N. BRODERICK, JUN., RYDE.

ON the 28th of September last the Isle of Wight, from Brightstone to Cowes, received a visitor happily little known in these latitudes—a tornado. Although its visit was brief, a few seconds sufficed to mark its duration in any given place on its fearful track; for in that short time its power was displayed in a manner terrible to contemplate. When all was once more still Mr. Broderick followed "in the track of the tornado" with a camera, and in the pictures before us has depicted in a manner far more vividly than any mere verbal description could the wonderful force of the hurricane. Here we find a gigantic tree broken off a little above the roots; there we find other trees twisted and rent asunder; while others have their bark peeled off.

On the Parade, Cowes, we find a hotel completely unroofed, a large portion of the walls being also demolished. But it is, perhaps, in the picture *The Ruins of Mr. Redfern's Cottage* that we can best appreciate the tremendous force of the power exerted by the wind. This displays a mass of bricks, rafters, and other *debris* of a house so completely dilapidated that only a small portion of a wall of the once cosy cottage remained to reveal the havoc wrought by the frightful visitant.

These pictures are highly interesting, and are admirable as photographs. We learn from the artist that several of the views were taken under circumstances anything but conducive to the production of pictorial work of a high class; yet, notwithstanding such adverse circumstances, Mr. Broderick achieved complete success.

THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC AND PHOTOGRAPHER'S DAILY COMPANION FOR 1877. Edited by J. T. TAYLOR.

London: H. GREENWOOD.

WHAT between the advertising pages, of which there are 132, and the text, to which 214 pages are devoted, this once tiny annual has rapidly assumed voluminous proportions, at least as respects the amplitude of its pages.

To review this work, in the sense of offering an opinion as regards its merits, in the pages of THE BRITISH JOURNAL OF PHOTOGRAPHY, with which it is so intimately associated, would be a display of questionable taste; but it will not be out of place to indicate some of its features.

The editor follows up the articles on the optics of photography, given in former issues of the ALMANAC, by devoting some space this year to the subject of the magic lantern—a topic in which there is an ever-increasing interest displayed by photographers. This article is copiously illustrated; and we may here observe that a great number of wood engravings are scattered throughout the book, all tending to elucidate the ideas of the writers of the articles thus illustrated. Professor Piazzi Smyth, Major Russell, Canon Beechey, the Rev. F. Hardwich, Mr. George Dawson, of King's College, Mr. Vernon Heath, and numerous other gentlemen who occupy a place in the foremost ranks of experimentalists, but whose names do not come before the photographic world with desirable frequency, are ably represented in this ALMANAC by their respective contributions. But the original articles are not contributed alone by the brethren of our own country, for essays of great value have been forwarded by *savants* residing in France, India, America, &c. To mention even the names of these active *collaborateurs* in connection with special topics or articles (of which the number considerably exceeds a hundred), might seem invidious, and hence we abstain from doing so. We may, however, state that among the themes upon which special attention has been bestowed in this volume are the various forms of emulsion processes connected with gelatine and collodion; the development of wet and dry plates, with special reference to the new developer of Mr. M. Carey Lea; printing by the carbon process; together with other matters of practical everyday interest to the operator or the scientist.

In the *Epitome of Progress during* 1876 the editor has given in a condensed form a detailed account of the leading discoveries made during the preceding twelve months, and in a similar manner he has treated all the patents connected with photography obtained during the same period. The various tables and formulæ towards the conclusion of the volume, and which form such a useful feature in connection with the series of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, have this year been subjected to modifications, certain additions having been made tending to prove of great value to the photographer.

It only remains for us to state that besides the diagrammatic illustrations to which reference has already been made, the ALMANAC this year is embellished with a choice work of art—a portrait of the eminent actress, Mrs. Rousby—printed by the Woodbury Permanent Photographic Printing Company, from a negative by Messrs. Fradelle and Marshall.

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Meetings of Societies.

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MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
January 25....	Liverpool Am. Photo. Asso.	Free Library, Wm. Brown-street.
,, 25....	Oldham Photographic Society ..	Hare and Hounds Inn, Y'kshire-st.

VIENNA PHOTOGRAPHIC SOCIETY.

THIS Society met on the 14th November,—Dr. Hornig occupying the chair.

The CHAIRMAN opened the meeting by expressing, in a few words, his thanks to the members for the congratulatory address he had received from them on the occasion of the twenty-fifth anniversary of his appointment as professor. The minutes of the previous meeting having been read and approved,

Dr. Hornig read a paper, by Professor Simony, on *Photographing in the Slate District*, which the author was prevented, by illness, from reading himself.

A letter from Professor Husnik, in which he gave his views on the adhesion of colour to the lichtdruck plate, and communicated a method, based upon that adhesion, of producing lichtdrucks in water colours, was then read and listened to with much attention. Great interest was also manifested in the specimens which accompanied the letter, and which were handed round for examination.

Herr Riewel then described a method he had employed profitably of weakening a too-dense negative, by repeatedly coating the dry plate with a concentrated solution of cyanide of potassium.

Herr Fritz Luckhardt showed the first series of portraits for the new *Wander Album,* on the subject of which there was a short but amicable discussion.

The Chairman read an extract from a letter he had received from the President of the Amsterdam Photographic Society, Herr Haakman. In the letter Herr Haakman warmly recommended the coffee process, saying that he had got good results with tannin, tea, tobacco, and morphia, but that latterly he had been working almost exclusively with coffee, by means of which he secured plates that keep for months.

Herr V. Angerer remarked that he also preferred this process.

The Chairman then laid two pictures on the table which he had received from Professor Axmann. They were impressions taken from the first attempts at etching doguerreotypes made by Professor Berres and Professor Axmann's father. On showing them he (the Chairman) expressed a wish that if any of the members should come across any old prints or plates possessing historical interest as illustrations of the early development of photography or its connection with the other graphic arts they would inform him, so that they might be added, if possible, to the Society's collection.

The subject of M. Klary's pamphlet and system of lighting was then revived, and a long account of their correspondence with M. Klary was given by Herr Luckhardt and the Chairman, in the course of which the latter said that he had advised the publication of a translation of M. Klary's pamphlet, at three francs per copy. The substance of Herr Luckhardt's remarks has already been given in *Foreign Notes and News,* as they were much the same as those contained in his communication on the same subject to Dr. Hornig, which was read at the last meeting of the Berlin Photographic Society. Herr Luckhardt then read a letter from a Herr Grainer recommending an enamel for prints, the formula for which he enclosed. [See *Foreign Notes and News,* page 32.] The subsequent proceedings were of little interest, and the meeting was shortly afterwards adjourned.

Correspondence.

January Meeting of the Photographic Society of France. — The 1,000 Francs Prize for Emulsions.—Photo-Engravings.—The New Washing Tap.—Mr. Woodbury.—Fatty-Ink Proofs by M. Rossi.—Presentation of Carbon Proofs by Mr. Harrison. — Gelatine Emulsion. — Fatty-Ink and Chromophotographic Proofs, by M. Léon Vidal. — Captain Abney's Discovery. — A Newly-Manufactured Orange Yellow-Coloured Glass for Dark Rooms.—A Portable Laboratory by MM. Gilles.—On the Violet-Coloured Light for Sitting Rooms,—M. Poitevin's New and Interesting Printing Process.

The Photographic Society of France held its monthly meeting on the 12th instant, instead of the 5th, on account of the new year's holiday. M. Davanne occupied the chair. The meeting was well attended, and the *séance* very interesting.

A commission was elected to judge of the merits of the samples of emulsions deposited on or before the 31st of December, 1876. If my readers remember, in one of my former communications to The British Journal of Photography, I informed them that a prize of 1,000 francs had been offered by the Photographic Society of France to anyone who would forward the best formula for an emulsion with prepared plates before the 1st of January, 1877. Only three persons have responded to the appeal. I am much surprised at this; for, if it be true, as is stated here, that the honour of the invention of emulsions is due to French ingenuity, still the success attained at the present day must be attributed to English and American experimentalists, among whom may be cited Messrs. W. B. Bolton, M. Carey Lea, W. J. Stillman, R. Kennett, Colonel Stuart Wortley, and others. None of these gentlemen—whether from want of knowledge of the fact that a prize was offered or from any other cause—came forward to vindicate their right to take part in the friendly contest for fame, and thus left the gauntlet without a struggle in which in all probability one of them would have had a great chance of becoming victorious. The prize and the honour will now be too easily won by one of the French competitors, who would himself have been too happy to have had the honour to say (if successful) that he had not only to contend for the prize with French manipulators, but also to struggle with *savants* of other lands well skilled in photography. The three competitors are MM. Chardon, Rossiquol, and Fabre. M. Chardon is well known to the readers of The British Journal of Photography as the inventor of the uranium dry-plate process. He is also one of the principal members of the Photographic Society of France.

M. Rousselon presented the Society with a beautiful collection of photo-engravings representing the pictures exposed in the last *salon.* These engravings cannot be too highly spoken of. M. Rousselon has, by his unceasing exertions, raised photo-engraving to a high standard; and, as M. Davanne truly remarks—"That if other nations held the sway with the collotype process invented by M. Poitevin—which it may be said, had been as it were put under a bushel—in photo-engraving France was far ahead of any other country in beauty of execution and in the practical results secured."

I had the honour to present to the Society the new washing tap, of which a full description is given in the The British Journal Photographic Almanac for 1877, page 174. After expressing my regret for taking up the time of the members for such a simple instrument, the President replied:—"Nothing is too simple which can benefit our art, and we do and shall always receive with pleasure any idea, instrument, or machine likely to further as well as to simplify photographic manipulations." I begged leave to inform the Society of the intention of Mr. Woodbury (which that gentleman expressed *par voie du* in The British Journal of Photography) to send some specimens of tinted proofs illustrated by his photo-colouring process. The Chairman expressed the willingness of the Society to receive such proofs.

Signor Rossi, of Milan, presented the Society with a number of very brilliant proofs in fatty ink, printed upon highly-glazed paper, such as was formerly used in a general manner for printing ladies' and gentlemen's visiting cards. The effect obtained is very brilliant, but the solidity of the image left very much to be desired; the slightest scratch left an indelible mark.

Mr. Harrison, an English gentlemen, presented some very interesting proofs in carbon, being the reproductions of drawings by F. Millet. This presentation was made in order to show the value of photography to painters, artists, amateurs, collectors, and others, so that each of them can see that by its aid his *cartons* can be filled with *souvenirs* of the great masters at very little expense. Mr. Harrison begged leave to pass round a few proofs made from Kennett's gelatine emulsions. This gave rise to a discussion, in which several of the members denounced the gelatine emulsion, it having proved a failure in their hands.

I asked to be heard, and after having given a *résumé* of the process and its great rapidity, I informed the Society of my visit to the inventor two years ago, and the magnificent proofs which I then saw, together with the extreme rapidity obtained in my presence by Mr. Kennett. I here take the occasion to publicly thank that gentleman for the kind manner in which he did me honour in showing his laboratory and house during my too brief visit to his establishment.

M. Léon Vidal, the infatigable worker of the carbon, collotype, and also of the photochromic processes, presented the Society with a magnificent album of twelve pages, bearing the title of *Les Mois.* The proofs, 8½ by 12 inches, are in fatty ink of divers colours, which give harmony to the whole; that is to say, each print is of a different tint. The history of the whole year is admirably told in golden verse by the celebrated François Coppée, and illustrated by the powerful designs of Giacomelli. January is personified by a flock of little birds in a snow storm; their different positions speak of the regions of winter and the sufferings of the feathered tribe during that period of the year. "March winds and April showers" are portrayed and, as it were, made visible by the genius of the artist. The picture represents the escutcheon of a Parisian house. Under the eaves are huddled together a great number of sparrows. Two solitary birds standing in the rain upon the most prominent parts of the escutcheon—waiting, as it seems, for a place to hide their heads—are so admirably and so naturally drawn that the water appears to be flowing from their feathery tails. May and the other months bring in gayer scenes, and so on till December, which represents an old owl, as it were, standing upon the tombstone of the past year, ready to seize upon her prey in the shape of a family of mice occupied in quarrelling about a few nuts extracted from their winter store.

M. Vidal also presented some very fine chromo-photographic proofs, being reproductions from objects of art in the Louvre. This gentleman has opened a public museum or gallery of his photochromic productions at No. 13, Quai Voltaire. Any photographer visiting Paris would do well to make a visit and judge for himself what progress has been made by the inventor in so short a time.

The Secretary of the Society drew the attention of the members to Captain Abney's discovery, as brought before the last meeting of the Photographic Society of Great Britain. As it was in the form of a suggestion it was not clearly understood by many of the members. I volunteered to give a *résumé,* and on my arriving at home I was pleased to see that my explanation coincided with that of the Editors, as published in the last number of The British Journal of Photography. This invention will clear up the mystery of the "warehousing" of light, on which much has been said and so little discovered. The fact existed, and was known, that an exposed dry plate must not be placed in the same box with an unexposed one, or blurring, double image, fog, &c., would be the consequence. Thanks to Captain Abney, this phenomenon will now be thoroughly studied, and science and art will be the gainers.

M. Appert presented some orange yellow-coloured glass chimneys for gas, lamps, &c., for use in the dark room. It has been personally known to me that our esteemed colleague, M. Davanne, has been making experiments, conjointly with M. Appert, to obtain the best colour suitable for that purpose. After many unsuccessful trials a fixed colour was chosen, of which the chemical compound can always be the same. We can now, thanks to M. Davanne, work with certainty with artificial light without fear of fog, &c.

M. Lampué presented a new portable laboratory constructed by MM. Gilles, the wooden framework of which, intermingled with cardboard, is very light; the whole doubling up like a folding camera makes it very easy to carry. The newest feature in it is that the hands only enter into the laboratory; the operation of development is followed by looking through a piece of yellow glass. A mirror is employed to reflect the exterior light under the plate during the manipulations.

M. Scotellari—the Italian who proposes the new mode of lighting the photographic sitting-room by means of violet-coloured glass and blinds—requested the Society to appoint a commission to judge of the value and truth of his invention. MM. Franck de Villechole, Liebert, and Ferrier were chosen, and a *rendezvous* was appointed for Sunday morning, the 14th inst. I solicited and obtained permission to be present.

Our old friend, M. Poitevin, the inventor of the carbon, collotype, and other photographic processes, has at last awaked from a long trance, and has given us a new method of printing. Although not photographic, still it is a proof of deep observation, and may be of service to science. M. Poitevin had often observed that mushrooms at a certain state of maturity, when allowed to remain a specified time upon a plate, left a trace of their presence. This he discovered to be caused by a kind of coloured powder or pollen which detached itself from the "leaves" of the mushroom. He placed a mushroom upon a gelatinised sheet of paper, and covered the whole with a glass cheese cover to prevent the air deranging the operation. In six hours he obtained a perfect reproduction of the fungus, which for sharpness of outline and beauty of design left nothing to be desired. The specimens that M. Poitevin showed me, and which were left for the Society, could not be distinguished from chromolithographic proofs. Whether this interesting observation of our eminent contemporary will be of service to art and science time will show.

On Sunday morning last every one was at the *rendezvous* made at the studio of one the principal photographers of Paris to experiment with the violet light. The readers of The British Journal of Photography may remember that in a former communication I spoke of this new idea, and said at the same time that it was contrary to the experiments made by Mr. Gaffield, of Boston; but, granted that these experiments were made with chloride of silver, I suggested that perhaps iodide and bromide of silver were more sensible to the violet rays. Therefore I took a certain interest in the experiments about to be undertaken. At 9.30 a.m. we were introduced into the sitting-room, the glass of which had been coated with a transparent, violet-coloured composition. One or two of the persons present complained that their eyes were fatigued. As for myself, a few minutes elapsed before I could see distinctly and accustom my eyes to the strange glare. A few negatives were produced both by the coloured and the white light, and I must say that a little advantage was certainly in favour of the violet light. But the experiments did not succeed so well as the inventor led us to hope, for he stated that the time of exposure could be diminished by half. It is true the weather was very dull, and, according to my appreciation, this was a disadvantage to the process. It appears that whatever be the intensity of the light no blinds are required to moderate it, as with the white light. On the whole I was surprised at the results obtained, for I am now convinced that a violet-coloured light does not lengthen exposure, but, on the contrary, shortens it. I will keep my readers *au courant* of other experiments which will be undertaken by the commission.

3, *Place Bréda, Paris, January* 16, 1877. E. Stebbing, *Prof.*

FADING.

To the Editors.

Gentlemen,—There have been many inquiries made in your valuable Journal, and also many letters, on the subject of fading and its causes in silver prints. Some suggest as the cause the bronze lines on the cards; others decomposition of the albumen; others bad washing and imperfect fixation; but none seem to arrive at anything definite on the subject.

I have been troubled for the last few weeks particularly with this troublesome annoyance, and I have tried hard to ascertain the cause, and have succeeded so far that I have become convinced it is caused by damp or atmospheric action on the cards which causes the starch with which the prints are mounted to decompose and thereby bleach through the picture, its first indication being a mottled appearance that afterwards keeps on spreading until eventually it completely bleaches them away.

What makes me feel so confident on this matter is that the studio I use is constructed entirely of wood; and, not wishing to have a fire on account of smoke or dust, I have done without one this winter. Being such a wet, damp season I have, however, found that the cards have gone quicker than ever before in my experience, while prints done at the same time, but which have not been mounted, have not faded at all.

Apologising for trespassing on your valuable space,—I am, yours, &c.,

January 15, 1877. W. Wilkinson Darwen.

Miscellanea.

"Talk in the Studio."—A Constantinople correspondent writes:—The representatives of the Powers went the other day to the studio of Abdullah to be photographed in a group. When they were posed the operator said to them in French—"Don't move, gentlemen, don't move." "Parbleu!" said the Count de Chaudordy, "you may say that to the general (Ignatieff), but the rest of us are quiet enough, I assure you." Some minutes elapsed before the countenances of the delegates were sufficiently composed for the photograph to be taken.

Development.—On this subject Mr. A. S. Elgood writes as follows:—"The assistance given to development by pouring the developer off the plate for a few seconds, spoken of at the meeting of the Bristol and West of England Photographic Association and reported in the Journal of the 12th inst., seems to me to be due most probably to the consequent increase in the proportion of nitrate on the film; for we know what an amount of washing a dry plate will stand before the nitrate is sufficiently removed to allow of applying the gallic, &c., preservative or re-sensitiser, which otherwise would act something like a developer."

Mounting Photographs.—In the specification of a patent obtained (provisionally) by Mr. Raphael Tuck, for a roller for mounting photographs, he says:—"The object of my invention is the providing of an efficient means of pressing and thereby securing the perfect and smooth adhesion of photographs and scraps, or small pictures, to the surface upon which they are to be mounted, and of doing so effectually and with greater quickness in time than has hitherto been attainable. My invention consists in constructing a frame of metal, wood, or any suitable material, so as to have two points or bearings to carry the axis or shaft of a pressing roller. To the exact shape or form of this frame I do not confine myself, but in all cases I provide it with a handle or lever to assist the operator in the use of the roller for applying the pressure. The pressing roller may be constructed of wood, india-rubber, gutta-percha, or any similar suitable material. It carries as hereinbefore stated an axis or shaft, or axes or shafts, or pins upon which it rotates, and the axis or shaft passes into the bearings hereinbefore named. The pressing roller has around it by preference a cover of vulcanised india-rubber, which fits it or renders it by its elasticity more particularly applicable for the purposes indicated in the title of this invention."

Photography in Court.—In the Bloomsbury County Court, on Friday last, the case of Cook *v.* Harris was heard before Mr. Judge Russell. The plaintiff, Charles Sawyer Cook, a photographer carrying on business at 154, Euston-road, sued the defendant (the manager of a photographic club), residing at Half Moon Crescent, City-road, to recover the sum of £4 15s. for photographs supplied to the defendant for distribution among the members of his club. The plaintiff gave evidence as to various transactions with the defendant. His son proved delivery of the goods and the application to the defendant on several occasions for payment, which until the present he had not attempted to deny. The defendant stated that he had paid various sums, amounting in all to 30s. 6d., to the plaintiff and his son, for which, however, he was unable to produce receipts, but said that if the case was adjourned he would be able to produce evidence in corroboration of his statement. The plaintiff and his son denied receiving any money from the defendant. The plaintiff further stated that the defendant had been paid for the portraits by the members of the club, and had also been paid a liberal commission by the plaintiff for the introductions, and he had therefore, in fact, been doubly paid, as the defendant had never paid him a farthing, even on account. The defendant pressed for an adjournment for the production of a witness to prove his payments; but the judge refused to grant the application, as the defendant ought to have come prepared with his witnesses. Judgment was given in favour of the plaintiff for the full amount claimed with costs of one witness. The defendant was allowed to pay by instalments of 15s. per month.

Trapping Planets.—The evil doings of a newly-invented camera form the theme of an article in the *Evening Standard*, in which the writer says:—"While professing every respect for the astronomer who goes star-hunting, armed with nothing better than a telescope of the best construction, and is content with bagging an occasional new asteroid, comet, or nebula, the *New York Times* introduces us, with every expression of contempt, to a new poaching astronomical instrument or star trap, which, in its opinion, is calculated to put an end to all legitimate astronomical sport. It appears that this 'soulless, pot-hunting person, who pretends to call himself an astronomer,' has been led, by his desire to settle the question of Vulcan's existence, to invent a planet trap, which, if it should come into general use, would speedily capture every star not yet in the catalogue. The new trap consists of a photographic camera, provided with clockwork and other wicked devices. This is set at nightfall in some secluded spot, and left to accomplish its infamous and unsportsmanlike purpose. A timid asteroid notices the light reflected from the trap, and thoughtlessly peeps into the camera. Instantaneously its likeness is taken, the negative glides from its place, a fresh plate advances into position, and the trap is again ready for action. The inventor intends to bait this trap especially with reference to the capture of Vulcan; but he asserts that, after leaving it set for a single night, he will find in the morning photographs of every star which has ventured near it during the night. The only suggestion that occurs to our contemporary is that star traps should be declared to be as illegal as the pound nets which have proved so ruinous to the fisheries, and we must express some surprise at finding such a suggestion for an extension of game laws in the columns of a republican American newspaper. It is a sign of an amendment of life."

EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale*, that being done at a small cost in our advertising pages. This portion of our columns is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

I offer to exchange an excellent *carte-de-visite* lens, by Ross, for a good long-focus pair of stereo. view lenses, six to ten inches, by any first-rate maker.—Address, Arthur Debenham, 28, Union-street, Ryde, I. W.

I will give Weston's cabinet burnisher, cost £5, and balance in cash, for one of Entrekin's or Weston's 10 × 8 burnishers. I will also exchange one of Moulton's rapid photographic washers (twenty inches) for his twenty-five-inch or larger machine; balance in cash or apparatus. Both the above are equal to new.—Address, W. Green, photographer, Berwick-on-Tweed.

ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

Notice.—Each correspondent is required to enclose his name and address although not necessarily for publication. Communications may, when thought desirable, appear under a *nom de plume* as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

⁂ We have been requested by Mr. James Keith, Arbroath and Edinburgh, to publish the following list of agents (received too late for insertion in the Almanac advertisement) for his patent system of heating studios:—Edinburgh: Messrs. James Milne and Son, Milton House. Glasgow: Messrs. George Mason and Co., 39, Union-street; and the Albion Albumenizing Company, Glasgow and London.

G. W. Taylor.—Received. Thanks.

A. G. R.—The best colour is a pale blue.

G. Terry.—We have not yet been able to obtain the desired information.

H. A. S.—Address a note to "the Editors," and enclose your name and address.

J. W. L.—There is no objection to your keeping the salts in the manner described.

J. S. Bright.—Your mode of utilising photography is undoubtedly interesting, and seems very plausible.

Bosnia.—The collodion will remain good for several months; hence the failure must be sought for in another direction.

J. K.—Neither are absolutely necessary unless under certain circumstances, which are explained in every manual of the art.

An Architect.—Archæological photography requires only the use of a non-distorting lens and a camera having a swing back.

W. B. Black.—The Howard tent will answer quite well for half-plates. Stillman's box tent will also prove very convenient.

T. R. M.—Let the west side of the room remain unglazed, and make the window on the east side about two feet wider than it is at present.

An Earnest Devotee.—Try *French* bitumen; this, we believe, will answer much better than the kind which we described as being procurable in Long Acre.

J. Jones.—If the collodion be good, it follows that the bath is in a disorganised condition. Try its strength, and ascertain if it be not supersaturated with iodide.

A. D. B.—The arrangement of lighting to which you refer did not "take," and its production is now discontinued. For the rest you should consult an architect.

Pylos.—Three inches will prove to be a suitable diameter for the lens. We cannot at present say where such lenses can be procured, but have no doubt that any optician in your town can obtain them to order.

J. (Oxon).—The pink tone of the portrait of the boy is owing to a reduction of gold over the surface, caused, probably, by your having conducted the operation of toning in a room too strongly lighted.

T. Chilton.—To obtain gelatine in a sheet pour it upon a tin plate, and when dry it may be removed by inserting the edge of a knife at the margin. The "exchange" will have to be inserted as an advertisment.

B. J. N.—Your conclusions are by far too sweeping; among foreign lens manufacturers there are several of the highest eminence. When your experience becomes more extended your opinions will undergo modification.

A. W. B.—(We cannot decipher the *nom de plume*). The only way by which the pyroxyline can be tested is to convert a small quantity of it into collodion and then see what result is obtained. The quality cannot be predicated otherwise.

A. S. T.—We are at present engaged in making the experiments required in connection with the matter; but till these are completed we shall not venture to bring it before the public. What you have heard from Mr. B. is quite true, however strange it may appear to you.

A. B (Leeds).—The *cartes* possess some good qualities; but, on the whole, we cannot advise you to commence business as a professional photographer. We do advise you, however, to make use of a background several grades lighter than that which you are at present using, and which is unnaturally black.

W. A.—The three lenses mentioned are constructed on the same principle, being all symmetrical cemented combinations with the denser element outside. There is no practical difference between them as regards working; but we doubt if any them will *sharply* cover such a field as you mention without a stop.

Hopeful.—1. Let the proportion of bichromate be such that it will not crystallise when the gelatins is poured upon a plate of glass.—2. Sunlight, or at least good daylight, is necessary; the lime light will not answer.—3. Try lead a quarter of an inch in thickness. A pressure of many tons is requisite.—4. Yes.

Venator.—A wet plate will keep quite good for two hours after preparation, provided that proper precautions are adopted. But while much will depend upon the chemicals employed, still more will depend upon the atmosphere in which the plate is kept. If this be moist the plate will keep for a longer time than that we have indicated.

H. M.—Your query betrays the fact that you are *not*, as you say you are, "a reader of this Journal," otherwise you would have been aware that we have just published in its pages a series of articles on the subject respecting which you inquire. The slides you saw were printed by the Woodbury process. Excellent warm tones can be obtained by making use of an emulsion process.

Argus says that he has had a great deal of experience in carbon printing, but has never met with such cases of reticulation as those mentioned at the last meeting of the Photographic Society of Great Britain, when the subject was discussed. On this matter we have only to remark that "Argus" is a lucky man, but in his "luck" he is not exceptional, as we are well aware that there are others to whom the reticulation of the film is quite unknown. From a perusal of Mr. Foxlee's article in our last number it will be seen that reticulation is a matter connected with drying. If you have dried all your tissue in accordance with those principles which experience has dictated as being correct, then your immunity from the evil of reticulation is very easily explained.

A Country Parson says:—"I observe that you attach some importance to the method of working moist plates in the field which was brought before the notice of the Photographic Society of Great Britain by Mr. Mawdsley. Passing over the fact that the process he described owes its origin to the late Mr. Thomas Sutton, permit me to inquire in what respect it is better than a dry-plate process of which enough is known by the operator to render each plate a 'dead shot?'"——In reply: we observe that faith and knowledge are two entirely different things. When two men go to the scene of photographic operations and expose plates previously prepared, but one developes his plates on the spot and the other delays that operation till he reaches home, the former possesses the *knowledge* that his negative is or is not all right; the latter, reasoning from a variety of causes, possesses *faith* that his will not be found to fail. But this faith must necessarily occupy a subordinate position to the knowledge of the former. Seeing "face to face" is much better than seeing "through a glass darkly." We do not desire to underrate the advantages of dry plates; we know that a considerable number of dry-plate workers can calculate with great certainty upon their plates turning out good. All that we contend for is this—that expectation in such a matter does not equal realisation.

Received.—J. Crosthwaite; "Alastor." In our next.

☞ Editorial Communications should be addressed to "THE EDITORS"—Advertisements and Business Letters to "THE PUBLISHER"—at the Offices, 2. York Street, Covent Garden, London, W.C.

METEOROLOGICAL REPORT,

For the Week ending January 17, 1877.

Observations taken at 406, Strand, by J. H. Steward, Optician.

These Observations are Taken at 8 a.m.

Jan.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks.
11	29·67	NE	39	40	41	39	Raining
12	29·84	W	33	34	39	32	Foggy
13	30·08	SE	37	38	42	33	Foggy
15	30·01	W	37	38	48	37	Cloudy
16	30·11	W	47	48	52	37	Dull
17	29·89	SW	50	52	—	47	Dull

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 873. Vol. XXIV.—JANUARY 26, 1877.

MODIFIED GELATINE EMULSION PROCESS.

Among the first questions raised in consequence of the publication of the fact that negatives of a high quality could be obtained by making use of a gelatine emulsion, there was one fraught with no small importance to numerous interests, namely—Will gelatine ever entirely supersede collodion?

Now it is, as we showed last week, one of the properties of gelatine that it rapidly enters upon a state of putrefaction when mixed with water; and this difficulty lay at the very threshold of its being utilised in a manner similar to collodion, which latter substance may be kept for an indefinite period. So much annoyance was experienced by those who took an active part in introducing to public notice the gelatino-bromide process, owing to the great rapidity with which it deteriorated—especially in hot weather—that, had not Mr. Kennett come to the rescue by indicating his method of preserving the emulsion in a desiccated form, it is probable the gelatine process, so far from having made the progress that it has done, would have been scarcely known at the present period.

As regards the question of the probability of collodion being superseded by gelatine, we are in a position to contribute something by way of reply. For a gelatine emulsion to compete successfully with one in which collodion forms the medium with which the bromide of silver is mixed, it is above all things necessary that it should retain its good qualities for a reasonable time—say a few weeks, if not months. Now, when gelatine is dissolved in water, it will be seen that after a few days a fungus will spring from its surface, and that fermentation and putrescence rapidly follow, this decomposition being more or less rapid according to the existing temperature. As we last week showed, this may be prevented by several agents which act as antiseptics. To that which has been patented by Mr. Kennett for photographic application we shall not here advert further than to say that, as moisture is an essential element in the production of putrefaction, and as the patentee eliminates all moisture from his pellicle, destructive change is rendered impossible.

But in order that gelatine shall successfully compete with collodion it is necessary that it must be at all times ready for use without certainly any more delay than the minute or two necessarily employed in warming and liquefying the emulsion; and it is when kept in this form that it is so liable to decomposition. It has long been known that the addition of creosote or carbolic acid acted with such antiseptic efficacy as to prevent putrefaction, but it has also been recognised that such substances, when in excess, interfere with the sensitiveness of the plate prepared from an emulsion so treated.

Some time ago, when the putrescence of gelatine formed a theme upon which much discussion took place, having prepared a sample of emulsion that worked well, we resolved to try one or two experiments with it so as to ascertain something concerning the possibility of using it some months after preparation. For this purpose we filled with it a small tin jar of the description, although not of similar dimensions, employed for holding Australian and other preserved meats. The lid was soldered on by means of the alloy of bismuth and pewter known as "fusible metal," all air having been first carefully expelled. Several months afterwards it was opened by immersing the end of the canister in boiling water, by which the solder became melted and the lid was removed before the gelatine had time to liquefy. On examination no change whatever in the emulsion appeared to have taken place. But, as the method of preservation here indicated does not recommend itself as being practicable, other methods are to be preferred.

Another portion of the emulsion was placed in a tightly-corked bottle, the cork being covered with an india-rubber cap. To this emulsion had been previously added a large—probably a needlessly large—quantity of carbolic acid. This, like the "tinned" emulsion, kept well; but, as the resulting pictures obtained from this gelatine were unsatisfactory, the experiment was not repeated in that form.

In a previous article we alluded to the antiseptic properties of certain essential oils. Which of these possesses this property in the highest degree we are at present unaware; but from the fact of oil of cloves being used in writing inks to prevent the decomposition of the gum, and of this oil being also employed to preserve the gelatine or glue contained in the useful little domestic glue-pot universally sold for sixpence, we infer that oil of cloves is found to be the best for the purpose. The trial we made of it, with a view to preserve an emulsion, was only partially successful, because, bearing in mind our error in adding too much carbolic acid in a former experiment, we here added rather too little; for, after a period of about two months, we found upon examination that decomposition had taken place, although only to a slight extent.

The mountant designated "parlour paste" is well known to the majority of our readers. It is made by placing gelatine in water to swell, after which the superfluous water is got rid of and the gelatine dissolved by heat, alcohol being slowly added so as to reduce it to a working degree of fluidity. Within the past fortnight we have received from Mr. W. Gray a sample of gelatine emulsion prepared, so far as we can learn, according to this plan. The large proportion of alcohol present confers two advantages—first, the emulsion, to all appearance, keeps well; and, secondly, when poured upon a plate it sets so rapidly as to allow a plate to be coated with it as if it were collodion. We found plates prepared with this alcoholised gelatine to be moderately sensitive, although much less so than some rapid aqueous gelatine emulsion we tried at the same time; there was sufficient, however, apparent to demonstrate the possibility of a useful emulsion being obtained by the agency of alcohol.

To prepare such an emulsion we steeped a packet of Kennett's pellicle in a mixture of Burton ale and water; and next, after removing every superfluous drop of water, we liquefied it in presence of alcohol, using for this purpose ordinary spirits of wine 65° over proof. To this was added one drop per ounce of oil of cloves. Two small plates coated with emulsion so prepared have yielded negatives of excellent quality, and these we have carefully put aside with the view of their affording data for comparison, when, in the course of a few weeks hence, we shall again try the gelatine emulsion we have preserved in the manner described. So far as we can at present discover the sensitiveness is rather inferior to that of plates prepared with a freshly-made aqueous gelatino-bromide; but, in view of the great advantages that may arise from having an emulsion always at hand ready for use, requiring only to be gently warmed, and one which will set with such rapidity as to enable the photographer to expose a plate within three minutes after it has been coated, we can afford to suffer a slight loss by way of compensation for the great gain secured by such treatment.

THE NEW DEVELOPER.

We need make no apology to our readers for bringing this matter once more before their notice, as its importance, in our opinion, is sufficient justification. We have since our last article was written continued our experiments, and, as we fully anticipated, obtained a clearer insight into the working of the developer, as well as greater power over its action, though, in the main, we have not discovered any material variation in its general behaviour.

First, as regards the "veil" we complained of last week as making its appearance at an early stage of the development: though we have not succeeded in entirely overcoming it, we have at least mitigated it to such a degree as to render it practically innocuous. This result has been secured chiefly by a greater amount of attention in the matter of the length of exposure; for we found by actual experiment that, although an increase of exposure produces comparatively little effect upon the better-lighted portion of the picture, the shadows and more delicate details exhibit the increased action in a remarkable degree. The peculiar feature of the hydrosulphite solution is its wonderful power in "searching out," as it were, detail unattainable by other means. The contrast between the respective behaviour of the old and new developers is very noticeable; for, whereas the effect produced by prolonging the action of the former is to give increased vigour with comparatively little additional detail, the latter continues to produce detail without a corresponding accession of density in the lights. Another line of experiment we have adopted with some success consists in varying the proportion of the hydrosulphite and pyro.; without recommending any fixed rule or formula in the matter, we may state that our experience leads us, so far, to believe that an increase in the quantity of the pyro. tends to the production of density and clearness, while a stronger solution of hydrosulphite increases the energy and rapidity of the development, but entails more or less of the objectionable veil. The addition of bromide for the purpose of preventing the latter defect appears, as far as we can judge, to be of little use; for, though it has the effect of restraining or *retarding* development, it does not perform the same function as in the ordinary alkaline development of keeping the shadows clear. It seems, indeed, to act merely by prolonging the time occupied in development without any accompanying benefit accruing.

The peculiarity we have mentioned in the action of this developer would appear to render it specially valuable in the production of the most delicate grades of half-tone, if suitable means be available for conferring the necessary amount of density. This, as we stated last week, is not secured with the same facility as in the ordinary method; but since those remarks were penned we have obtained results which enable us to modify to a considerable extent what we then wrote. The fact still remains that silver intensification is more difficult upon a hydrosulphite-developed image than upon one obtained by means of pyro. and ammonia; but we have reason to believe that much of the unsatisfactory nature of the results of which we then spoke was due to accidental causes. It must be borne in mind that the new solution is very different in its physical characteristics from the one it is intended to replace, consisting as it does of a dense, almost saturated solution of a crystallisable salt; so highly charged is the developer with crystalline matter that a plate or cup with which it has been in contact will, if set aside for a minute or two, be found covered with crystals. It must be evident that a collodion film impregnated with such a solution is freed therefrom with greater difficulty than we experience in the case of alkaline pyro., and its effect cannot be neutralised by the mere application of a wash of acid, as is a usual practice when alkali is used. It is absolutely necessary that it be removed perfectly by washing; for its action when brought into contact with silver nitrate is to produce stains by the reduction of the metal.

This will partially explain the results we at first experienced on attempting the intensification of these images by means of silver; but since then we have, by a more thorough washing of the plate and a modified method of intensification, succeeded in producing perfectly clean negatives, and, by the exercise of care and patience, have managed to secure more than necessary printing density. The method we have adopted is as follows:—After thoroughly washing the film pour over it a sufficient quantity of water to which has been added a small quantity of a twenty-grain solution of citric acid—say one or two drops to each drachm. After this has been poured on and off two or three times, add one drop to each drachm of a twenty-grain solution of silver nitrate and again flood the plate two or three times; finally, the pyrogallic acid is added, for which purpose the strong alcoholic solution will be found most convenient. In adopting this method all danger arising from any slight trace of hydrosulphite left in the film is obviated, for the restraining acid has time to permeate the pores of the collodion before the silver is added. The latter, coming in contact with the image before the pyro. is added, appears to exercise a beneficial action in preparing the image to receive the silver subsequently deposited. After the addition of the pyro. the process is exactly the same as usual.

Though silver intensification necessarily alters the characteristic appearance of the image of which we spoke in our previous article, the colour and quality of the deposit are still of a sufficiently distinctive character to proclaim that the ordinary alkaline development has not been used; and while in some respects the negatives have the appearance of pyro.-intensified wet plates there is a "something" which suggests that such is not the case. We frequently obtain various shades of colour resembling the erst-fashionable *fumée de Londres*, which are admirably adapted to negative purposes. From what we have already said respecting the difficulty in obtaining density an incorrect conclusion may, perhaps, be drawn. The class of negative produced by this developer is, probably, what will be considered by many as the type of what a negative should be, especially for use in carbon printing—thin and full of detail. We see nothing of the transparent glass shadows and feeble metallic detail too often encountered, and which are so suggestive of under-exposure; the shadows are soft and, at the same time, vigorous, the want of strength being chiefly noticeable in the high lights; and even then, owing to the non-actinic nature of the deposit, a false impression of apparent weakness may be given.

We had anticipated that by means of chloride of copper a more generally satisfactory result would be obtained; but, though under certain circumstances a fairly good result was attainable, the method is not so universally advantageous as we have previously found it. Thus, if the chlorised image be again treated with hydrosulphite no gain in density is noticeable; indeed, the result rather tends in the opposite direction. If, however, after treatment with chloride of copper the ordinary alkaline pyro. be applied, we secure an increase in the depth of the deposit; still even here it is not equal to the gain in an ammonia-developed plate. It would appear as if the deposit formed by the hydrosulphite differs in character from that produced by pyro. and ammonia—that some element is wanting which militates against the success of the operation. If a little additional silver be "piled on" by the acid method the copper treatment behaves in a more satisfactory manner and becomes really practicable, though, it must be confessed, it is a somewhat roundabout mode of working to have to resort to three different styles of development. We refer to these details merely with a view of pointing out the difference between the deposits formed by the old and new methods.

We may here mention a phenomenon which raises a question as to the nature of the reactions which occur in the formation of the hydrosulphite solution. In treating a chlorised film with hydrosulphite solution we omitted the pyro., and were astonished to behold the image disappear entirely, as if under the application of a fixing solution. The experiment was repeated three or four times with a similar result; but, when the pyro. was added first, the chloride was reduced with sufficient rapidity to prevent its solution except to a very slight extent. The films from which the image has been removed in this manner, if examined closely, show an extremely faint trace of the picture, which may be redeveloped to moderate strength with pyro. and silver. The inferences to be drawn from this are—first, that by the action of the cupric chloride the image is converted into a double salt which is soluble in the hydrosulphite of soda; or that in the reaction which occurs between the bisulphite of soda and the zinc a small quantity of hyposulphite is formed. Although we cannot see precisely in what manner this should occur, it will be conceded that the intimate connection between the salts in question—so far, at least, as their composition is concerned—would lend probability to this view. The first supposition gains support from the fact that no solvent action is noticeable upon a bromide film, however prolonged the immersion may be.

We remarked last week that both sulphite and bisulphite of soda, in combination with pyrogallic acid, are capable of exerting a developing action, though less energetic than that produced by hydrosulphite. We may now extend this statement to the hyposulphite, which, when used in very small quantity, will produce a feeble image, though of no practical utility. This action of hypo. is not, however, under any control, and cannot be relied upon in every case. The deposit formed by these various solutions, as well as their general behaviour, are quite similar to the hydrosulphite, differing merely in the minor details. Thus the sulphite forms a thin, clear image of the same colour as that obtained with M. Sammann's solution; the bisulphite a stronger deposit similar in colour, but accompanied by strong symptoms of veiling, almost amounting to decided fog. Whether they may be brought into practical use we are not yet able to say.

Since the earlier portion of this article was written we have received M. Sammann's notes on the preparation and reactions of hydrosulphite of soda [see page 41], as well as a letter, which will be found in our correspondence columns, with reference to our experience recorded last week. The former communication throws considerable light upon the action of the new developer, and is worthy the careful attention of all who are interested in the study of development. The theory of the composition of the latent image mentioned by M. Sammann, and attributed by him to M. Sahler, must, however, be credited to the late Mr. Thomas Sutton, who was strenuous in his endeavours to demonstrate the probability of the formation of an oxybromide of silver by the action of light. A fully-detailed account of his theory will be found in our columns during the fall of 1874.

In his letter M. Sammann surmises that the veil we have complained of is caused by the deposition of the double sulphite of soda and zinc; but for various reasons we cannot think this is the true explanation. In the first place, the veil is of a pinkish-yellow colour, exactly similar to the deposit produced by the development proper, while the double salt mentioned is a greyish white. We can perfectly well believe in the possibility of a deposit arising from such a cause if the double salt exist in the hydrosulphite solution; but in our own case we do not think such is the fact, for the addition of alcohol as described by M. Sammann produces no precipitate, and zinc tests show but the very faintest trace of that metal. We are rather disposed to attribute it to some accidental peculiarity in the emulsions we have used, and not to any necessary action of the solution.

It will, perhaps, be convenient to prepare the crystallised hydrosulphite in preference to using the extemporised solution, if the preparation prove to be of a sufficiently stable character. No difficulty will be experienced in obtaining crystals, as a quantity of the hydrosulphite solution left exposed in a test glass was found at the end of twenty-four hours to have commenced to crystallise, and after three or four days, without the application of any artificial heat, had become a solid mass. These crystals, however, by the absorption of oxygen, had returned to the state of bisulphite, but were ready to be re-utilised after a second treatment with zinc. It is thus evident that no waste need occur, as any solution not used while fresh may be set aside to crystallise, when it is capable of performing the requisite functions a second time.

In conclusion: we may repeat the opinion we expressed in our previous article, that the new form of development will be found, eventually, a most valuable addition to the chemistry of our art-science, and we should strongly recommend our readers to become acquainted with its use before the outdoor season commences and other matters claim their attention.

EDINBURGH PHOTOGRAPHIC SOCIETY'S EXHIBITION.

[Fourth Notice.]

Before this meets the public eye the Exhibition will have been closed. So far as at present can be ascertained the Edinburgh Photographic Society, and especially those of its members who have been more immediately connected with the collection of the pictures and general management of the Exhibition, have much reason to congratulate themselves on a success unprecedented in the annals of photographic exhibitions. We shall in a future article have something to say with regard to the causes which have produced such results, and, meanwhile, will confine our remarks to a notice of a few of the pictures in several of the classes not yet noticed.

Of landscapes by amateurs there is a very excellent show. Mr. Panton's *Maiden Bridge* (No. 270) is a fine picture of a beautiful subject, treated in such a way as to be an example to all who desire to do good work.

Much more ambitious in point of size are several pictures, of about 20 × 16, from collodio-albumen negatives, by Mr. Sanderson, of Manchester. They are characterised by great breadth of effect, much judgment in the selection of the point of view, and bold, vigorous treatment, although lacking atmosphere, or aërial perspective. *Rydal Water, Westmoreland* (No. 283) is a fair specimen. The composition is excellent, and the picture is only wanting in a feeling of atmosphere between the eye and the mountain on the right to make it perfect.

Mr. Williamson, of Edinburgh, shows twenty-four pictures (No. 4) of fair average merit, although they are nearly all deficient in atmosphere. Several in which dead game are introduced are faulty, as the animals seem to have become stiff before being photographed. *My First Stag* is, however, an exception, being a very fine production. The sportsman and the spoils of his gun occupy the foreground—a piece of bleak moorland; and the distant hills rise to various altitudes and are at varying distances beyond, each being charmingly shown in its relative position by a hazy atmospheric effect, which makes the work a most exquisite picture. Almost equally good, although in a different way, is his *Glenmoel Fall, Island of Lewis*. Here we have some fine masses of well-defined rock, over which falls a cascade of beautifully-transparent water—an instance in which has been successfully overcome one of the greatest difficulties in photography. Photographers, however, should take a lesson from this as an example of an otherwise nearly perfect picture spoiled by the introduction of an utterly unsuitable cloud negative.

Glasgow, although so closely allied with Edinburgh, has done very little for this Exhibition; but Mr. John Parker is a host in himself. He gets, and deservedly so, a medal; but not, we presume to think, for his best picture. His *Kilburn Glen* (No. 440) is a beautiful bit of work—simple in composition and treatment, but thoroughly effective, and just the kind of subject most dear to amateurs—a pool in the foreground overhung by wild flowers, and reflecting on the one side a fern-covered bank, and on the other some fine picturesque trees. The pool is fed by a tiny cascade, hardly sufficient to give character to the picture, but sufficient to suggest motion, and break up the otherwise mirror-like surface of the pool. Technically this is, perhaps, one of the most perfect pictures in the Exhibition.

Combination pictures are also well represented. Mr. H. P. Robinson, of Tunbridge Wells, is, as usual, *facile princeps*. His *Preparing Spring Flowers for the Market* is labelled "sold," although the most expensive picture for sale in the Exhibition.

The works of Mr. A. Diston, of Leven, and Mr. George Bruce, of Dunse, are familiarly known, and both artists are well represented. It is somewhat puzzling why the latter adheres so pertinaciously to the peculiar slaty-blue colour—a result, we understand, of the use of collodio-chloride paper; and we are quite certain that if he could be induced to tone his pictures in some respects like other artists his results would meet with much more favour, although not more than he deserves. As a specimen of very high-class work we would instance his *Wanderers in a Foreign Land* (No. 753), where a number of those quaint-looking alpine musicians, who are occasionally to be met with in our streets, are artistically grouped. The foreground and background are suitable and characteristic, and there is a well-selected cloudy sky. This picture is less blue than most of the artist's other works, and only serves to show how very beautiful they would be if printed in something like popular colours.

We annex the awards of the Judges of apparatus, processes, and materials:—

Report of the Special Judges appointed by the Exhibition Committee to Award at their Discretion Three Silver and Three Bronze Medals for Improved Apparatus, Materials, Processes, &c.

Your Judges, having carefully examined the various exhibits in these classes, are unanimous in granting the following awards:—

1. A silver medal to Professor Charles Piazzi Smyth, for the plano-concave corrector (No. 1031).—This is a new optical arrangement which, being placed in close proximity to the prepared plate, completely prevents the effect of the spherical aberration of the portrait or other lens, and allows full aperture to be used. In the example exhibited this is adapted to a brass camera which has several extremely ingenious arrangements for obtaining copies of objects in rapid motion.

2. A silver medal to Mr. H. Fox Talbot, for three specimens of photoglyphic engraving (No. 1135).—These prints, although the plates have been made from negatives which are by no means perfect, are examples of the earliest process of photo-engraving on metal, and exhibit in parts a perfection which is not surpassed by the most beautiful of the many fine examples of modern work of the same class. The invention dates from 1853, when the inventor first published the process, and the specimens are now exhibited by him.

3. A bronze medal to Mr. L. Warnerke, for his ingenious adaptation of sensitised collodion tissue for the production of transparencies, negatives, &c. (No. 1134).—Although not the invention of the exhibitor, still the adaptations have been carried out so skilfully and completely, and the entire arrangemenis made so simple, that he may be said to have made into a workable process that which was not so before.

4. A bronze medal to Mr. P. Meagher, for an improved folding camera for single pictures 9 × 7 and under (No. 1138).—This camera, without being too complicated in design, contains many improvements and adaptations, some of which are new and highly ingenious, and the workmanship is excellent.

5. A bronze medal to Mr. William Birrell, of Hamilton, for his automatic oxyhydrogen apparatus.—Repeated trials of this apparatus show that it gives a steady, constant light, and is capable of great extension in power.

Your Judges, while confining themselves to these five awards, may remark that several of the exhibits merit favourable mention, among which are those of Messrs. George Mason and Co., Kemp and Co., Mawson and Swan, Mr. George Hare, &c., and had they not been precluded by the stringent rule laid down that objects, materials, and processes in competition must be exhibited by the inventor or maker thereof, they would have had pleasure in considering many of them; and also Mr. Willis's ingenious platinotype process, specimens of which are exhibited, but not by the inventor. In cameras for changing dry plates in the field they would have made an award, but that of M. Jonte, of Paris, is not exhibited by himself; and that of Mr. Aird, in addition to being in the same category, could not be adjudicated upon in consequence of Mr. Aird being one of the Judges.

J. G. Tunny.
W. H. Davies.
John Nicol, Ph.D.
David Aird.

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Captain Abney's detailed account of his researches on alkaline development, which will be found in another column, affords interesting food for study to those who turn their attention in that direction, and, as we stated a week or two since, promises not only to reopen the whole question, but to throw considerable light upon points which have up to the present time been shrouded in obscurity. We have already recorded our experience in the practical application of the effect produced by re-coating a plate with a sensitive emulsion after exposure, and we would now call our readers' attention to one point which seems to present specially interesting features. We will mention first the statement of Captain Abney that a sensitive film superimposed upon an already developed plate is capable of rendering a duplicate picture when treated with an alkaline developer. This startling fact will, no doubt, be eagerly seized upon by the supporters of the physical theory of the light's action, as a strong argument against those who prefer to attribute the formation of the latent image to a purely chemical change, and it is difficult to see how it can be read otherwise; but equally powerful arguments in favour of the physical view have hitherto failed to convince the supporters of the opposite theory. Take, for instance, the well-known fact that a plate, after fixing, may have the image entirely removed by means of nitric acid or acid nitrate of mercury, and still be capable of producing another image under the action of a further development. It is scarcely to be imagined that if the change which takes place under the action of light be of a purely chemical character any of its effect can possibly remain after the entire removal of all matter of a chemical nature from the film; and it may be, we think, with reason accepted as an undoubted fact that an extraordinary physical disturbance is set up during exposure, and which remains long after the exciting cause is removed. But there are some who argue that this molecular disturbance is, in itself, due to chemical causes—a view we can find little to support. So long as the sensitive haloid remains on the film to take part in the reaction we can understand the possibility of a chemical solution of the problem; but the production of an image upon material chemically inert to the influence of the developer appears to us beyond the range of explanation by a chemical theory. Even in the case mentioned by Captain Abney we have a film of sensitive haloid, but any impression produced upon it without exposure to light owes its origin to the action of the surface on which it rests, and it would be equally reasonable to expect a similar effect to be obtainable from a film supported upon a perfectly clean silver or glass plate as to imagine it to be due to a chemical action exercised by the silver forming the under-image. It would be interesting to know whether a developed plate from which the image has been removed is capable of originating a like action upon a superimposed film.

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NOTE ON THE SO-CALLED RETICULATION OF CARBON TISSUE.

[A communication to the Photographic Society of Great Britain.]

The phenomenon of reticulation must not be confounded with that of insolubility; the former is to a certain extent a curable defect, while the latter is not. A sheet of tissue which exhibits a uniform granulation of black particles over its surface on development may be regarded as having become to a certain degree insoluble previously to printing, and is valueless.

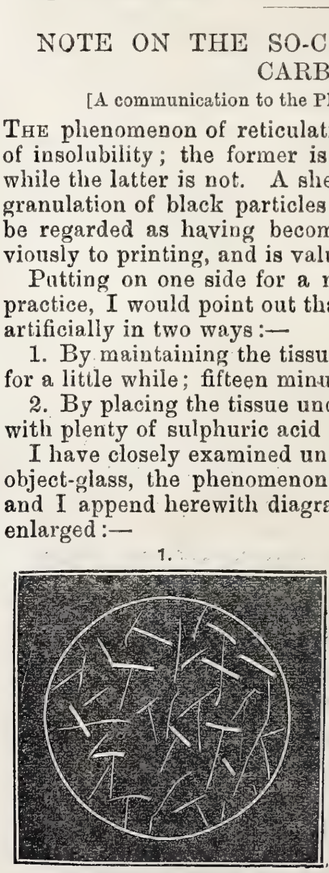
Putting on one side for a moment reticulation as it is found in practice, I would point out that the phenomenon is to be produced artificially in two ways:—

1. By maintaining the tissue at a warm temperature (say 100° F.) for a little while; fifteen minutes will suffice.

2. By placing the tissue under an air-pump for twenty-four hours, with plenty of sulphuric acid to absorb the moisture.

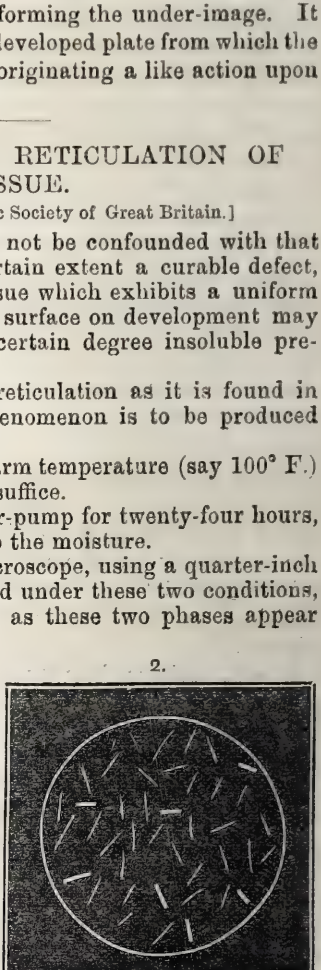
I have closely examined under a microscope, using a quarter-inch object-glass, the phenomenon produced under these two conditions, and I append herewith diagrams of it as these two phases appear enlarged:—

1.



HEATED TISSUE.

2.



AIR-DRIED TISSUE.

It will be observed that the markings are more exaggerated when the tissue has been heated than when it has been subjected to the more uniformly drying action of the air-pump. In the former case the reticulation has proceeded so far that I should deem the defect incurable; but in the other instance, with caution, the tissue could be brought back to its normal condition.

When reticulation has proceeded as far as in the heated specimen I show, the appearance of the film under the microscope (after development, of course) is very similar indeed to the lifting of the film of a collodion negative, and, like the latter, the raised portions begin to crack and open when the film becomes thoroughly dry. In this case the lines run into one another like the cross-markings on one's hands. I know of nothing that will mend matters under these circumstances.

Where, however, the reticulation has not proceeded so far, as in the case of No. 2 specimen, and the defect is confined to short lines or marks which do not run into one another, then the tissue may be made use of under certain circumstances.

Reticulation, then, in my opinion, is due to the gelatine in the tissue having been robbed of too much of its moisture, and having undergone a change from which it does not frequently recover, and then only with difficulty. It has suffered contraction to such an extent that it is well-nigh impossible to bring it back to its normal condition. The only way is to develope upon a basis that is not fixed. The single-transfer process, by reason of the slippery character of the basis, permits the expansion again of the tissue, and this particular method favours, therefore, the recovery of the film to a great degree. It is the same with mixed plates—zinc, for instance—the coolness of the metal in this case also having a tendency to rehabilitate the gelatine; but a collodion film does not allow of the gelatine moving in this manner, and hence we find reticulation occurs most frequently when collodion is employed as development basis, for the image will not stir from the firm grip it has taken upon the collodion. On some occasions I have found tissue useless for development on glass by reason of reticulation, which developed without a trace of that phenomenon on cold zinc plates well waxed.

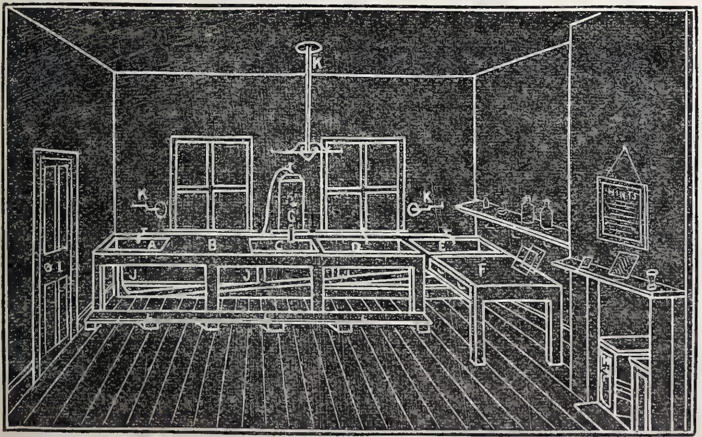
Water as cold as possible should be employed in soaking the exposed tissue first of all, and an immersion for a few minutes will not do harm in hot weather. The development is then undertaken in water not too hot (the temperature varies much with the nature of the tissue and time of year), and a final rinse in hotter water still is sometimes beneficial in securing a clearer image and preventing any "swimming" of the picture from soluble pigment that may not have been washed away.

Too much stress cannot, in my opinion, be laid upon printing and preserving sensitised tissue in a cool locality.

H. Baden Pritchard.

CARBON PRINTING *ATELIER.*

Having had occasion to arrange a set of rooms for carbon printing I thought it possible that the accompanying design for a developing-room might prove useful to some of the readers of The British Journal of Photography. Seeing the general interest now prevalent with regard to permanent printing, the matter of suitable rooms for working purposes is worthy of consideration.



A.	Cold water sink.
B.	Table for squeegeeing.
C.	Hot water sink.
D.	Cold water for final rinsing.
E.	Alum for fixing.
F.	Table for waxing plates, &c.
G.	Maughan's geyser for hot water supply, or may be laid on from boiler, H, heated by fire.
I.	Door of drying-room.
JJJ.	Waste pipe from sink.
KK.	Gas.
LL.	Stage elevated slightly from floor.

We are well aware that much better work can be executed in a well-fitted place than can be produced with makeshift or limited appliances, where the mind is in a continual state of worry and excitement for fear something should prove unequal to the demands made upon it.

Much time and consideration have been devoted to the best arrangement of the dark room, &c., and, considering the delicacy of manipulation and care required to produce the best results in carbon, the arrangement of rooms becomes a matter of importance.

The various articles in the room and their uses will be clear on referring to the lettered explanation.

J. Crosthwaite.

NOTES ON THE NEW DEVELOPER—HYDROSULPHITE OF SODA.

These notes are only suggestions to explain the developing action of the hydrosulphite of soda developer.

Preparation.— Hydrosulphite of soda $\left(\mathrm{SO^2NaH} = \mathrm{SO}\left\{\begin{matrix}\mathrm{H}\\ \mathrm{NaO}\end{matrix}\right.\right)$ is formed by the action of bisulphite of soda upon zinc.

$$\underset{\text{Bisulphite of soda.}}{3\left.\begin{matrix}(\mathrm{SO})''\\ \mathrm{NaH}\end{matrix}\right\}\mathrm{O}^2} + \mathrm{Zn}'' = \underbrace{\left.\begin{matrix}(\mathrm{SO})''\\ 2\mathrm{Na}\end{matrix}\right\}\mathrm{O}^2 + \left.\begin{matrix}(\mathrm{SO})''\\ \mathrm{Zn}\end{matrix}\right\}\mathrm{O}^2}_{\text{Double sulphite of soda and zinc.}} + \underset{\text{Hydrosulphite.}}{\mathrm{SO}\left\{\begin{matrix}\mathrm{H}\\ \mathrm{NaO}\end{matrix}\right.} + \mathrm{H}^2\,\mathrm{O}$$

It is the double sulphite that forms the greyish sediment in the zinc bottle, and most probably the veil complained of by the Editors.

The formula shows that 312 parts of bisulphite give 88 parts of hydrosulphite, so that the developing solution contains hydrosulphite to the extent of eleven per cent.

If you take one part of this solution and pour it into three parts of strong alcohol the whole quantity of the double sulphite will be precipitated; and if the supernatant solution be placed in well-stoppered and filled bottles in a fresh place, after a short time all the hydrosulphite of soda will have solidified in a crystalline mass, which it will be possible to remove and to dry. This must be done *in vacuo*, or in a bottle filled with dry carbonic acid to avoid the action of the air.

The dry hydrosulphite keeps well, and dissolved in water to the strength of ten per cent. will form the hydrosulphite solution.

Dr. Wurtz has shown that the reducing power of hydrosulphite is 1·5 that of the bisulphite of soda which generated it.

Hydrosulphite of soda absorbs oxygen and gives bisulphite.

$$\mathrm{SO}\left\{\begin{matrix}\mathrm{H}\\ \mathrm{NaO}\end{matrix}\right. + \mathrm{O} = \left.\begin{matrix}(\mathrm{SO})''\\ \mathrm{NaH}\end{matrix}\right\}\mathrm{O}^2$$

100 parts of hydrosulphite absorb 18·1 parts of oxygen.

Pyrogallic acid used plain absorbs oxygen and gives purpurogalline.

100 parts of pyrogallic acid absorb 22 parts of oxygen.

$$4\,(\mathrm{C^6H^6O^3}) + 7\,\mathrm{O} = \underbrace{\mathrm{C^{20}H^{16}O^9}} + 2\,\mathrm{CO} + 2\,\mathrm{CO^2} + 4\,\mathrm{H^2\,O}$$

Pyrogallic acid used alkaline absorbs oxygen and gives pyrogalleine.

$$\text{(A)}\quad 3\,(\mathrm{C^6H^6O^3}) + 6\,\mathrm{N\,H^3} = 3\,\underbrace{(\mathrm{C^6H\,^5N\,H^4O^3})}_{\text{Pyrogallate of ammonia.}} + 3\,\mathrm{N\,H^3}$$

$$\text{(B)}\quad 3\,(\mathrm{C^6H\,^5NH^4\,O^3}) + 3\mathrm{N\,H^3} + 9\,\mathrm{O} = \underbrace{\mathrm{C^{18}H^{20}N^6O^{10}}}_{\text{Pyrogalleine.}} + 8\mathrm{H^2\,O}$$

100 parts of pyrogallate of ammonia absorb 33 parts of oxygen.

This seems to show an inferiority in the hydrosulphite developer; but let us consider the different working formula given.

Ordinary Alkaline Developer.—Capt. Abney gives in his "instructions," page 73, the formula:—

$$\left.\begin{matrix}\text{Pyrogallic acid, 12 grains}\\ \text{Water..........1 ounce}\end{matrix}\right\}\ \tfrac{1}{2}\text{ ounce}\qquad \left.\begin{matrix}\text{Liquor ammonia (·88) 1 part}\\ \text{Water.............. 4 parts}\end{matrix}\right\}\left.\begin{matrix}\text{3 drops, then}\\ \text{2 drops more}\end{matrix}\right\}\text{5 drops}\qquad \left\}\begin{matrix}\text{Water—}\\ \text{100 parts in wght.}\\ \text{Pyrogallic—}\\ \text{2·4 parts in wght.}\\ \text{Liquor ammonia—}\\ \text{·352 parts in wght.}\end{matrix}\right.$$

If we take the strongest liquor ammonia it is possible to procure it will contain thirty-six per cent. of $\mathrm{N\,H^3}$, so that the formula contains ·127 of $\mathrm{N\,H^3}$; but (A) and (B) show that only half of the ammonia can be utilised in the formation of pyrogallate, so that we have to deal only with ·0635 of $\mathrm{N\,H^3}$. This quantity combines with ·4445 of pyrogallic acid. Thus we have—

$$\left.\begin{matrix}\text{Pyrogallic acid .... 2·4 minus ·444 g.} = 1{\cdot}9555\\ \text{Ammonia pyrogallate .. ·4445} \times \text{·065 g.} = {\cdot}508\end{matrix}\right\}\text{ absorbg. }\left.\begin{matrix}{\cdot}43\\ {\cdot}168\end{matrix}\right\}\text{ oxygen.}$$

$$\overline{0{,}598}$$

Hydrosulphite Developer.—Water, 100; hydrosulphite of soda, 5; pyrogallic acid, 1.

$$\left.\begin{matrix}\text{5 parts by weight, hydrosulphite absorb } 5 \times {\cdot}181 = {\cdot}905\\ \text{1 ,, ,, pyrogallic acid ,, } {\cdot}22 = {\cdot}22\end{matrix}\right\}\text{ oxygen.}$$

$$\overline{1{\cdot}125}$$

Strong Alkaline Developer.—We find the following at page 77 of Capt. Abney's "instructions":—

$$\left.\begin{array}{l}\text{Pyrogallic acid..96 grains}\\ \text{Alcohol .... 1 ounce}\end{array}\right\}\tfrac{1}{2}\text{ drachm}\qquad\left.\begin{array}{l}\text{Liquor ammonia 25 minims}\\ \text{Water .... 1 ounce}\end{array}\right\}2\text{ drachms}\qquad\left.\begin{array}{l}\text{Potassium brom. 12 grains}\\ \text{Water .... 1 ounce}\end{array}\right\}\tfrac{1}{2}\text{ drachm}$$

$$\left.\begin{array}{l}\text{Water ......100 parts in weight}\\ \text{Pyrogallic ac. 3·3 ,, ,,}\\ \text{Liquor amm. 3·52 ,, ,,}\\ 4\times{}\cdot088\text{, containing 36 per cent.}\\ NH^3 = 1{\cdot}27\, NH^3.\end{array}\right.$$

But as only half of the ammonia combines with pyrogallic acid we have—four parts pyrogallate of ammonia absorbing 1·32 oxygen.

In this way we see the relative reducing power of the three developers:—

$$\frac{1{\cdot}125}{{\cdot}508} = 2{\cdot}2 \;\ldots.\; \frac{1{\cdot}32}{1{\cdot}125} = 1{\cdot}17 \;\ldots.\; \frac{1{\cdot}32}{{\cdot}508} = 2{\cdot}59.$$

The power of the strong developer ought to be rated a little higher, for the uncombined ammonia has a reducing action.

It is easy to see that the hydrosulphite produces twice the effect of the ordinary, but not quite so much as the strong, developer. Incidentally I may state that this last formula—strong alkaline developer—is as near perfection as possible, differing only $\frac{8}{1000}$ from the theoretical formula.

Remarks on the Theory of the Hydrosulphite Developer.—Here I have to introduce a hypothesis on the action of light on a sensitive film which we owe to M. Sahler, C.E.; it was described by him in the *Bulletin de la Société Francaise de la Photographie* for 1876. It explains well and simply all the circumstances and phenomena I know of in photography:—

Iodide, bromide, and chloride of silver under the influence of physical agents, such as light, heat, electricity, &c., may absorb the oxygen of the air, and form double salts—oxyiodide, oxybromide, oxychloride of silver—

$$3\, Ag\, Br + O = Ag^2\, O\, Ag\, Br + 2\, Br.$$

—the free halogen being absorbed by the organic substances presented, preservative or others. If this halogen get free again it will decompose the double salt, giving a haloid of silver. This will happen under various circumstances, and cause solarisation, fading out of the image, and other accidents.

On this double salt acts pyrogallic acid:—

$$7\, Ag^2\, O\, Ag\, Br + 4\, (C^6\, H^6\, O^3) = 14\, Ag + 7\, Ag\, Br + C^{20}\, H^{16}\, O^9 + 2\, Co + 2\, Co^2 + 4\, H^2\, O.$$

On the same salt acts hydrosulphite of soda:—

$$Ag^2\, O\, Ag\, Br + S\, O\left\{\begin{matrix}H\\ Nao\end{matrix}\right. = 2\, Ag + Ag\, Br + \left.\begin{matrix}(So)''\\ NaH\end{matrix}\right\}O^2.$$

Fifty per cent. of the silver present in the "light-altered" salt is reduced to the metallic state.

Bromide of silver is reduced to metallic silver by the hydrosulphite developer.

In a test tube I precipitated bromide of silver in the dark room, washed it, and then, without taking it to the light, I added pure hydrosulphite solution of ten per cent. with some pyrogallic acid. No action was perceived immediately, but twenty minutes afterwards the precipitate had turned black, and was formed of metallic silver, readily soluble in nitric acid. This property may be used for recovering silver from residues. The cause of the developer only acting on the altered silver may be probably this:—The probable reaction is—

$$2\, Ag\, Br + 2\, \left(SO\left\{\begin{matrix}H\\ Nao\end{matrix}\right.\right) + O = 2\, Ag + 2\, SO^2 + H^2\, O + 2\, Na\, Br.$$

To decompose the hydrosulphite a certain molecular action is necessary. The bromide of silver in its nascent state—that is, parting from another combination—is more active than ordinary bromide of silver (just as nascent hydrogen is a stronger reducer than ordinary hydrogen); so that as long as "altered" silver bromide is present this will enter into the reaction, and only when no more is present will the ordinary silver bromide be reduced.

The presence of SO^2 would indicate the usefulness of carbonate of soda being present in the developer to absorb it, or, better, some sulphite of soda, which does not precipitate the zinc from its combination with sulphite of soda (double salt).

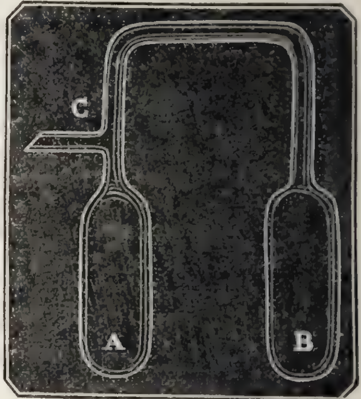
I hope that I have convinced my readers that the hydrosulphite developer is well worth a trial, and I am sure that when abler experimentalists than I am shall have worked out the details of the process it will prove very useful to dry-plate photographers.

L. O. Sammann, C.E.

ON THE ALKALINE DEVELOPMENT OF THE PHOTOGRAPHIC IMAGE.

Since alkaline solutions have been introduced for the development of the photographic image there has been a certain amount of ambiguity regarding their action. It has usually been assumed that their sole function is to reduce to the metallic state the particles of silver bromide which have been acted upon by light.

The alkaline developer consists of pyrogallic acid or other oxygen absorber, an alkali such as ammonium hydrate, and a restrainer such as potassium bromide. These are generally mixed together and applied to the film on which has been impressed an invisible image in the camera. Those parts acted upon by light darken under the influence of the solution; whilst, if the surface be in a proper condition and the proportion of the restrainer to the alkali be well balanced, the portions unacted upon by light remain unchanged. The image thus formed is soluble in nitric acid; and further tests show it to be metallic silver. In order to discover the part which the alkaline developer played to cause this reduction a large series of experiments have been made, conducted in the laboratory of which I have charge; and the results appear sufficiently interesting to be published.



Bulbs were made of the shape shown in the accompanying figure. In A was placed, whilst carefully excluded from all light, thoroughly washed silver bromide and pyrogallic acid. In B was placed a solution of potassium hydroxide or other alkali except ammonium hydrate. If ammonium hydrate were required the bulb B was made double; in the first was placed ammonium nitrate, and in the other potassium hydroxide, calculated so that the ammonium salt should always be in excess when the potassium was brought into contact with it. The tube C was attached to a Sprengel pump; and when the apparatus was exhausted C was sealed, and the whole of the alkali caused to enter A. After from two to sixty hours the bulbs were broken, and the solids and liquid kept for analysis. As far as can be judged, the silver bromide was instantaneously attacked by the alkaline pyrogallate. (There is no action due to pyrogallic acid on the silver bromide without the presence of an alkali, as was proved by keeping them in contact for weeks and noting their appearance.) After a large number of experiments it was found that the amount of silver bromide capable of reduction was primarily dependent on the amount of pyrogallic acid present, and in a secondary degree on the amount of alkali present. Thus one equivalent of pyrogallic acid can reduce four equivalents of silver bromide to the metallic state, if sufficient alkali be present to combine with the bromine liberated. The solution, after evaporation to dryness, was found insoluble in benzole or ether, &c., and only partially soluble in alcohol. A part of that dissolved was further found to be the bromide of the alkali; and the excess of alkali not in combination with carbonic acid was also found in the solution. The amount of carbonic acid was found to be considerable—equal to one equivalent of pyrogallic. (It seems unnecessary to give the analysis of the organic residue. Apparently the compound formed is totally different from that obtained by Stenhouse* when investigating the action of bromine on alkaline pyrogallate.) From the above experiment it will be noted that the reduction of the silver is independent of the absorption of external oxygen, and that only a definite amount of silver can be reduced by a given amount of pyrogallic acid.

When, in addition to the alkali, a large excess of soluble bromide was added to the bulb B, the same results were obtained, though the reduction of the silver bromide seemed to take rather longer time to effect. The following is an example of the quantities employed in these experiments:—

In bulb A was placed .... 300 grains of Ag Br and
10 grains of C_6H_6O ;
In the bulb B was placed ... 300 grains of KHO,
dissolved in the least possible quantity of water.

The amount of Ag found to be reduced was 33·86 grains; and the amount of KBr found in solution was 36·97 grains.

Layers of thoroughly-exposed and unexposed silver bromide were next treated with a rather weaker solution of the alkaline developer; and when the restraining soluble bromide was omitted the reduction to the metallic state took place in each layer almost equably. When the soluble bromide was present in equivalent quantities with the alkali, the reduction took place first in the layer that had been exposed to light, and spread gradually into the other layer. From this we may gather that the exposed silver bromide is more readily reduced than that unexposed, and that the solution of soluble bromide and the alkali acts less vigorously than the alkali alone.

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* *Journal of the Chemical Society*, January, 1875.

Another point to investigate was as to the means by which the density in an alkaline-developed image was produced; for it could not be supposed that merely those atoms of silver bromide which had been reduced to the state of sub-bromide would be attacked, since the sub-bromide of silver is essentially a coloured compound, and can be distinguished even in small quantities. A plate prepared with silver iodide was flowed over with tannin and dilute albumen, and dried. It was then exposed in the camera, and, after exposure, half of it coated with an emulsion formed in collodion by silver bromide. Now a photographic image impressed on silver iodide is not amenable to alkaline development unless the solutions be excessively strong. An alkaline developer made as below was therefore employed:—

1.	
Pyrogallic acid	16 grains.
Water	1 ounce.
2.	
Potassium bromide	20 grains.
Water	1 ounce.
3.	
Liquor ammoniæ (·880)	½ ounce.
Water	8 ounces.
Or, Potassium hydroxide	15 grains.
Water	1 ounce.

One part of Nos. 1 and 3 were added to every three parts of No. 2. As might have been expected, but a trace of an image was seen on applying the developing solutions to the uncoated iodised plate (and this trace was subsequently proved to be due to the sensitive albumen salt); but where the emulsion had been used an image gradually appeared—not very strong, but still perfectly visible and of printing density.

Silver bromo-iodide plates were treated in the same way. In this case there was a feeble image on the part uncoated with bromide emulsion; but on that part coated with emulsion the image appeared on the bottom surface of the emulsion film, and gradually worked its way up till reduced silver was obtained on the top surface, where the light had most strongly acted on the exposed film. The recoated half-plate, on fixing with potassium cyanide, gave a perfectly bright image, clear and dense, whilst on the other half it remained feeble.

With bromide plates in which only a feeble image could be obtained the same procedure gave the requisite density; and this fact is likely to be of practical value.

It was next proposed to ascertain in which film the developed image was really situated—whether in the exposed or the unexposed film. The double films, which had been treated as described, were taken from the glass plate by applying a damp piece of gelatinised paper to the surface; and, after detachment, a similar piece of paper was applied to the surface which had been next the glass. When very nearly dry the two pieces of paper were pulled apart; one film was found attached to one and the other to the other. Considerable difficulty was found in this operation, and only about twenty per cent. of the whole were properly manipulated, through our not being always able to hit on the exact amount of desiccation.

In examining these films differences were observable. In some cases the image was found to lie almost entirely in the exposed film, whilst in others a strong image was obtained in the unexposed film. The difference was eventually found to depend on the alkali used in the developer, and on the porosity of the collodion in which the emulsion was formed. When ammonium hydrate was employed and a porous emulsion the image was on the exposed film; whilst if potassium hydroxide were employed a vigorous image was in the top unexposed film. This can be explained through the solubility of silver bromide in ammonium hydrate. The silver bromide would be first dissolved by the ammonium, and then, during the course of reduction, be carried down to the reduced silver beneath it. Since silver bromide is insoluble in potassium hydroxide, the haloid would be reduced *in situ.*

Having determined this point, it was next endeavoured to ascertain if the photographic image impressed by light on the bottom surface caused a sympathetic action in the unexposed emulsion film. Plates were prepared as before, one half being coated with emulsion after exposure, and put aside for some days. The films were then separated as described, and to each the developer was applied separately. With one or two exceptions *no image was obtained on the unexposed film.* The reason of an image (always imperfect) being obtained in some cases was traced to the adhesion to it of the thin layer of albumen with which the exposed film was coated; for when the albumen was applied after exposure no image was developed.

The foregoing experiments clearly show that the photographic image has no power of transferring itself, or of creating a sympathetic action in an unexposed film *previous to development,* and that, therefore, the increase of density and formation of a secondary image must be due to other action than chemical.

If further proof be required, it is only necessary to expose a dry plate and develope it in the ordinary manner, and after drying to coat it with an emulsion, and develope again. It will be found that where the metallic silver of the first image is beneath it there the top film developes and gives a counterpart of it. The metal exercises an attraction for the silver on the point of being reduced from the bromide in a similar way that it does when a silver tree is built up, or when a developed image is intensified by the application of pyrogallic acid and silver nitrate. There seems to be a further action, however, which must be taken into account. It has already been shown that silver sub-bromide is more easily reduced to the metallic state than is the bromide. In these last experiments I have found that there is great difficulty in starting the development in the unexposed bromide film if the layer of albumen be too thick, but that when once started it proceeds more rapidly. This can be accounted for on the supposition that the attracting particles of silver were too far distant from the emulsion film to exercise their attractive power.

But it seems, from other experiments which are still in progress, that the atom of reduced silver immediately combines with the nearest molecule of silver bromide and forms sub-bromide, which is reduced to the metallic state, and its two atoms of silver combine with two other molecules of silver bromide, and so on, the image being gradually built up in this manner. Workers accustomed to alkaline development must have noticed that the feeble image first formed in the film grows in intensity rapidly up to a certain point and then flags. The reason of this is apparent if we consider the above reaction to take place, and the subsequent exhaustion of available silver bromide which can be acted upon.

One more experiment must be noted. If the film of albumen or gum, &c., between the two films be very thick a reversed action will take place, which can be explained by the fact that the strength of the developing agent is exhausted in producing the image on the exposed parts of the under film, whilst on the other portions the silver bromide most readily attackable is in the upper film.

I have already indicated that this application of a film of silver bromide after exposure, either before or after development, might prove useful when employing plates which only yield a thin image when developed in the usual manner; other applications will suggest themselves. I have also previously pointed out that intensity may be given to an image by alkaline development if a silver compound soluble in the alkali be gradually added to the developer. This new method, however, seems the preferable one to adopt.

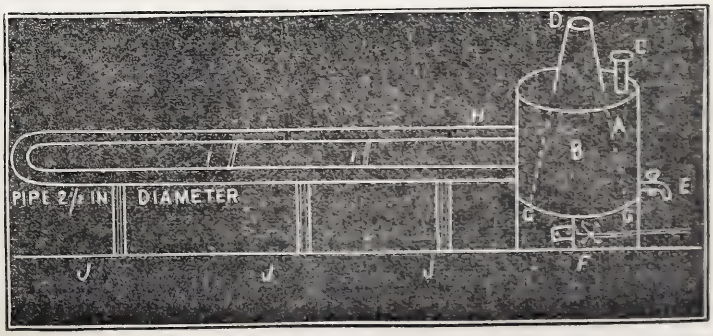
W. de W. Abney, *Capt.* R.E., F.R.S.

—*Philosophical Magazine.*

WARMING THE STUDIO.

I send a sketch of a warming apparatus. I have tried several kinds without having been pleased, for there is both danger and dirt with coal or coke stoves, besides the attention required; and a gas stove is of no use to me, my gallery being thirty-six feet long.

My apparatus is devised upon the following plan, and if it be of any use to your numerous readers they are welcome to it. It is not patented. After being lighted about an hour it makes the gallery warm and comfortable, and the cost is only about 20s.



A. Body of boiler, made of block tin, ten inches wide by sixteen inches high, with an opening at the bottom, from J J to F, for a gas jet — one of Wright's air-burners used for heating water. B. The dotted lines show an opening from the bottom through the top of the boiler, to give more heating surface. The opening is six inches at the bottom and two at the top. There is no soot or smoke. C is an opening for filling up the boiler and pipes. It holds about fifteen gallons of water. D. Top of the chimney. E. Tap to draw off the water when not in use. F. Small door at the bottom to get at the gas burners. G. Bottom of boiler. The distance between F and G is about six inches for the gas-burners. H. The pipe—two and a-half inches diameter, twenty-four feet long, and six inches apart. I. Supports. J. Wood supports for the pipe. G. W. Taylor.

MECHANICAL PRINTING IN WATER COLOURS.

[A communication to the Photographic Society of Vienna.]

About six years ago I wished to ascertain exactly the power possessed by an exposed chromated gelatine negative of partially taking on fatty ink, and I found that the usually-accepted explanation was insufficient. The usual explanation is that the water repels the fatty colour; therefore, where the gelatine is much swollen—that is, has taken in much water—little or no colour adheres; but where the gelatine can swell little—that is, is drier—there it takes on the colour more freely. This explanation is correct so far as it goes, but it is not exhaustive. Certainly the degree of wetness or dryness of the different parts of the gelatine is the principal cause of the greater or smaller quantity of fatty ink taken on. It is, however, not water alone that repels the fatty ink, but every very fluid substance possessing no adhesiveness; even oil repels a fast colour if it be also fatty, and if the latter be adhesive on being rolled it is drawn out into threads.

In order to make the thing clearer I shall give a simple example. If one were to dip a finger into a thick solution of gum arabic and then place it upon a dry body, such as glass, paper, or even the other fingers, the sticky finger would adhere to the substance in question, and on removing the finger forcibly the gum would be found to have separated into two parts, one of which would continue to adhere to the finger while the other would be transferred to the other substance or body. It would be quite otherwise, however, were the gummy finger laid upon a wet place. Then the gum would no longer adhere, none of it would be transferred to the other body, nor would it leave any trace on the place where it had rested; so that if it be wished to transfer a little of the gum to the wet place one must rub it until the water has mixed with it and has attained a certain firm consistency.

The same phenomena may be observed if, instead of the thick solution of gum, a thick varnish or an oil colour be placed on the finger and then the latter be placed alternately upon a dry body, or on one treated with fluid oil. The dry body will take on a share of the colour equal to that left on the finger, while by the mere placing of the finger upon it the body treated with oil will not take on the colour. In the latter case the finger may be removed without difficulty, a very small portion of the thin oil from the body treated with it adhering to the coloured finger, the converse property being shown. It is, therefore, evident that not only does water repel fatty colours, but a thin fluid repels a thick fluid; and this even takes place when they are one and the same substance, but of different fluidity and concentration.

I took a very thick solution of gum arabic to which I added glycerine and colour, and treated a lichtdruck plate with the mixture. I found that this colour was taken on in the same way as the fatty varnish colour. The first picture, indeed, was not good, nor the second, nor the third, since the thickness, or the consistency, of the colour must correspond exactly with the dryness of the gelatine film. This proportion, however, soon adjusts itself. Should the colour be too thick and the gelatine film too wet, the picture will take on almost no colour, but the colour will draw to itself some of the moisture from the film. With the first impression a little water remains in the paper, but the film is drier, and, on being rolled a second time, already takes on more colour, and so on until the lichtdruck plate attains exactly the required degree of moisture. Thereafter this proportion remains constant, and the operation may be continued regularly. The gummy water-colour gives off each time to the film as much moisture as the latter can absorb, thus feeding it continually with moisture, so that damping the film with water and then drying it between the pulling of each impression is rendered quite superfluous. This process is, therefore, especially suited for Schnell-press printing.

The gum colour is prepared as follows:—Gum arabic is dissolved in water, and as much glycerine is added as there was originally of undissolved gum. The mixture is then boiled and the water separated by evaporation. One has now a store of a very adhesive, thick solution of gum, which cannot dry up any further. To this one can add colouring matter to taste, the best of which is, however, good china ink; but fine lampblack with Prussian blue may be used, water being added and the colour rubbed down fine. When the colour is rubbed down it must be evaporated again to its former firm, sticky condition, which may be most quickly done upon a hot sheet of copper. In this state the colour is stored, and when it cools it becomes even firmer. Care should be taken not to mix in too much colouring matter, because then it makes the colour short and prevents it from rolling out in threads. When the colour is required for use it should be thinned, but not too much, with glycerine to the consistency of lithographic ink. The rollers used with such colour must be saturated with glycerine some days before being taken into use to prevent them from sucking the moisture from the colour. In printing the same rules must be observed as in the common process with varnish colour. Too thin colour gives flat pictures without white places; too thick colour, on the contrary, gives hard pictures with strong shadows and white lights. Most of the proofs printed with this colour that accompany this communication were produced six years ago and remain unchanged.

As soon as the proofs have been pulled the pictures are dry, because the colour is itself very fast and not easily blotted, and the paper absorbs the rest of the moisture. The paper should only be slightly damp when used for printing, because a dry paper would exhaust the moisture of the gelatine too quickly, so that it would be necessary to move the rollers backwards and forwards for a long time before the requisite equality is acquired. A gelatine film from which the moisture has been exhausted in this way takes on colour all over, and the picture then appears all black. As already mentioned, the film must be rolled until it has absorbed the necessary moisture from the colour, and, with judicious treatment, this constant proportion between the moisture of colour and plate when once obtained is easily maintained, and the printing can go on pretty fast.

The prints can also bear to be treated with water, gelatine, varnish, &c., so that by some of these substances any gloss desired may be produced, only the picture should not be rubbed while in a wet condition, as they are then easily blotted. The ease with which they can be blotted when in a damp condition is the only means by which one can recognise the genuineness of a water-colour print, and is also the only thing in which, compared with varnish-colour, it is at a disadvantage. For pictures, however, which are never likely to be stored in a damp place—at anyrate not long enough to injure the paper—I believe the use of water-colours has practically no disadvantage, but offers great advantages. The colours themselves are cheaper, and do not dry up in the cases; there is no loss like that caused by the drying up of resinous colours; the rollers retain their elasticity and no crust forms upon them which has to be scraped off daily; the hands are more easily washed clean and so are the stones and rollers, and a cheaper cleansing medium serves them than is required by things coated or smeared with resinous colours; and the air is no longer contaminated with the vapour of the indispensable oil of turpentine. J. Husnik.

HOW TO ASCERTAIN THE STRENGTH OF A SILVER BATH.

Premising that after a negative bath has been in use a short time it is impossible to estimate with any degree of accuracy the proportion of silver contained in it by means of the hydrometer or argentometer, owing to the formation of other salts by the immersion of the collodionised plate, other methods of determining its strength by volumetric processes have been devised to ensure accuracy. The latest of these has been published in *La Moniteur de la Photographie*, by M. Boivin, which possesses, at any rate, the merit of simplicity.

Into a vial graduated in cubic centimetres—say 0 to 25—M. Boivin introduces at zero the requisite quantities of the following liquids:—

Distilled water	1,000 c.c.
Dry chloride of sodium	6 gr. 9
Bichromate of potash	1

In a test tube he pours about two cubic centimetres of the bath to be analysed, and of this adds, drop by drop, enough to the solution in the graduated vessel to effect a certain change.

The deep-coloured precipitate at first formed turns gradually to white by the further addition of the silver. As soon as this result has been attained, by reference to the graduated scale on the bottle the precise quantity of the silver solution that has been employed to effect the change will be noted. The figure observed gives exactly the weight of nitrate of silver contained in ten cubic centimetres of the bath submitted for analysis.

It is perferable to use this means for ascertaining the strength of nitrate of silver baths that have been used, as this method gives exactly the weight of the nitrate of silver, because baths, while working, become charged with various salts.

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INTERNATIONAL PHOTOGRAPHIC EXHIBITION AT EDINBURGH.

In pursuing my notices of works in the above Exhibition I wish to call attention to the very picturesque contributions of Mr. John Annan, Princes-street, and especially those ranging from No. 337 to No. 342 respectively. *On the Almond, Craigie Hall* (No. 338), is a well-chosen subject, rich in its bosky luxuriance of vegetation and playfulness of light and shadow. *Edinburgh, from the Castle* (No. 337), is also remarkable for its delicacy and quality of texture, which may at the same time be said of the picture, *Bank of Scotland and Old Town, Edinburgh, from Princes-street* (No. 342). In the *Photographic Picnic to Winton Castle*, 1876 (No. 351), and *Dalwick, Peebleshire* (No. 352), there is shown very carefully-manipulated work; in short, it may be said of Mr. Annan's productions that they stand well out among the host of exhibits.

Of Mr. E. R. Yerbury's works I find in the south room a very fine untouched portrait, in carbon, No. 970, and in No. 969 a somewhat aërial view of *The Castle Esplanade, with 91st Highlanders.* Nos. 741 and 742 are also excellent carbon enlargements.

Mr. P. Low shows very attractive work in No. 127, a frame of twelve imperial portraits, as well as in No. 143, a frame of fourteen cabinet portraits.

Mr. J. M. Turnbull, in No. 79, *White Horse Close* (collodio-bromide emulsion), his only contribution, is very effective. In No. 135, a frame of cabinet portraits, Mr. Alexander Nicol exhibits some very pleasing work.

Of works contributed by our local amateurs, those of Mr. George A. Panton, Vice-President of the Edinburgh Photographic Society, bulk most largely. For his picture, *Maiden Bridge, Newbattle* (No. 270), he has been awarded the silver medal for that class of work; and, looking at the award from an artistic point of view, the Judges have done well in thus marking their appreciation of it. Besides a fine clearness of detail, it is pervaded by an atmospheric softness and breadth which a few photographers would do well to imitate, or at least observe, as it is in this very respect that many productions, otherwise beautiful, are found wanting, namely, in the absence of the feeling of sunlight. Of Mr. Panton's other contributions I must point out *The Coliseum, Rome* (No. 526), and *The Forum, Rome* (No. 536)—admirable for their massive strength and sunny power. In No. 684 Mr. Panton exhibits a reproduction of Sir J. Noel Paton's *Fairy Raid,* photographed by Messrs. Thomas Annan and Co., which is very pleasing.

Mr. R. J. Muir, Edinburgh, holds the bronze medal for No. 105, *Maiden Bridge* (the same subject alluded to above), which is remarkable for its fine development of light.

No. 4 is a collection of twenty-four views of Highland scenery, by Mr. Andrew Williamson—really admirable in selection, and produced with an amount of painstaking care worthy of the highest commendation. In some of the pictures there is, perhaps, a tendency to hardness of outline; it must be remembered, however, that in the estimation of many photographers this is considered a *sine quâ non* in the quality of their work—whether rightly or wrongly I shall leave for artists to judge.

Of several contributions by Mr. Alexander Mathieson there is capital material in No. 146, the *Guard-House, Holyrood* (dry collodion), as also in No. 642, *Architectural and Landscape Studies* (beer and albumen), and No. 647, *Holyrood,* &c. (collodio-bromide emulsion)—all interesting, as showing the results of various processes.

Mr. Hugh Pillans exhibits (No. 867) a frame of pictures, five being by the wet and eleven by the dry process (beer and albumen), which will be found interesting to lovers of the art.

Professor C. Piazzi Smyth, Royal Observatory, is remarkably strong in his marvellous cloud-land illuminations, the result, evidently, of deep insight and very great care.

Among the Scottish contributors from a distance who stand pre-eminent I find the name of Mr. G. W. Wilson, of Aberdeen. In his *Scottish Scenery* (Nos. 307, 316, and 331) there is a very pleasing selection of subject-matter, all rendered with the attractiveness, beauty, and vigour peculiar to Mr. Wilson. In the group of *The Queen and Princess Beatrice* (No. 783), carbon enlargement, and *Portrait of a Child* (No. 835), also carbon, are to be found nicely-disposed arrangements of light, shadow, tone, &c.

Mr. Thomas Annan, Glasgow, has two very charming productions. In *Oban* (No. 305) and *Bothwell Castle* (No. 306) there is excellent rendering of cloud scenery. *White Cattle, Cadzow Forest* (No. 325), and *Summer Evening* (No. 326), are equally felicitous. I have observed excellent work in his portraits of Professor Lushington, Principal Caird, D.D., and Professor Allen Thomson, D.D.

The composition pictures of Mr. Adam Diston, Leven, cannot fail to be highly appreciated. In *The Broken Toe* (No. 547), and Nos. 993 to 999, in the south room, there are first-rate specimens of his pictorial skill. In these subjects Mr. Diston works with a high aim, and, in so doing, it is to be hoped that his efforts will be duly rewarded in every sense of the term.

The veteran, Capt. Horatio Ross, exhibits a number of truly excellent works, of which may be noticed *A Stag Shot in the Forest* (No. 221); *A Living Stag* (No. 273), enlargement from dry plate; *Dead Stag* (No. 482), enlargement, from dry plate; and *Doch-na-Drudan* (No. 492), an enlargement, also from dry plate. Nothing could better show the character of the man than these records of deer-stalking and photography. All honour to him!

Mr. Thomas H. Douglas contributes two characteristic enlargements in *l'adoube* (No. 552), enlarged by Messrs. George Wilson and Co., and *The late Thomas Powrie, Esq.* (No. 561). In the latter will be recognised an excellent likeness of an old Edinburgh favourite.

Among the works of Mr. George Bruce, of Dunse, I may point out *Biding His Time* (No. 744), *Wanderers in a Foreign Land* (No. 753), *At Farrier's Shop* (No. 754), and *Waiting for the Boat* (No. 755). All are very picturesque in manner and finish.

As was to be expected, the photographers of England are not only very numerously but very powerfully represented. The masterly productions of the London Autotype Company attract general attention, and although in many cases they only show enlargements from the works of others, the general massiveness and beauty of their work have gained for them the meed of unlimited esteem. The Judges have done well in awarding them one of the extra silver medals for general excellence. In this case, where all are so good, it would be superfluous to particularise.

Among the works chiefly examined and admired I may mention first those of Mr. Marshall Wane, of Douglas, Isle of Man. His *Mdlle. Carlotta Le Clercq* (No. 225) is in every respect a very entrancing production, being beautiful in its stately pose, tone, and texture. His *Sleeping Baby* (No. 456) is simply charming. His *Portrait of Captain Loch, Fane's Horse, Irregular Cavalry, India* (No. 241), in which the slightest retouching may be decerned, is also very fine. In addition to these Mr. Wane shows several portraits of ladies all of very high artistic quality.

Messrs. Robert Faulkner and Co. are particularly strong in *Photographic Studies of Expression* (No. 627), carbon—a really exquisite production. So also are *Little Dorothy* (No. 620) and *Instantaneous Portraits of Children* (No. 628). *Simplicity* (No. 621) will remind many of Sir Joshua Reynolds's charming portraits of children.

Mr. George Nesbitt, Bournemouth, comes to the front in *How Does It Go?* (No. 37), as well as in his *Study in White Dress* (No. 248). *Yes or No* (No. 257), *On Guard* (No. 415), and *Who is it Like?* (No. 439), are likewise particularly attractive.

Of the exhibits of Mr. R. Slingsby, of Lincoln, attention must be called to his *Portrait, Direct* (No. 476) and *Ada, a Study* (No. 477), both very excellent. For faithful work I also point out two portraits (Nos. 478 and 479).

Mr. C. Ferranti, Liverpool, shows *Specimens Illustrating the Chromotype Process* (No. 58) which will be interesting to photographers. *Mina Temple as Juliet* (No. 659) and *The Evening of the Ball* (No. 662) will be regarded as impressive photographs. *A Poet* (No. 665) seems to be a good deal retouched, but is very excellent work nevertheless.

Mr. H. S. Mendelsshon, of Newcastle, is a large contributor, and pretty strong in what are called "Rembrandtish" portraits. Some of them in cabinet and whole-plate portraits (No. 525), for instance, are produced with striking effect. Perhaps his best works are *Miss Annandale* (No. 655) and *Master Annandale* (No. 688), both being replete with great breadth and vigour. I observe that Mr. Mendelsshon also exhibits *Axwell Park, Afternoon,* the seat of Sir Harry Clavering, Bart., which is a good picture. The same gentleman also exhibits a capital *Portrait of Richard Cail, Esq., Ex-Mayor of Newcastle* (No. 66), likewise an enlarged carbon *Portrait of Dr. Embleton, Newcastle* (No. 483).

Of the works of Mr. H. P. Robinson, Tunbridge Wells, I can scarcely speak too highly. His composition picture, *Declining Day* (No. 304), is a highly-artistic work, pervaded by a quiet, agreeable tone in background and sky. His picture, *There is a Willow Grows Aslant the Brook* (No. 336), is also in most parts fine—indeed very fine; but I cannot see or even imagine where or how he gets the reflection of the tree trunks on the right of the picture. A very excellent work is *Preparing Spring Flowers for Market* (No. 409). The light and shadow is here admirably balanced and the detail throughout beautifully and delicately rendered. *His Own Fireside* (No. 554) is a very fine conception of quite an original character most graphically interpreted. Its depth and brilliancy are superb, and nothing could be grander than the old man's head. Mr. Robinson shows well in all his compositions. For No. 554 he receives one of the silver medals.

Of Colonel Stuart Wortley's exhibits it may be said that it would be impossible to conceive anything finer than his seascapes. *Desolate* (No. 295) and *Swirling Water* (291) especially show at a glance what choice selection of material and patient industry can really accomplish in this art. There is also a quality of tone here that has been most happily rendered, being warm, soft, and flexible. His *Flotsam* (No. 129) and *A Quiet Afternoon* (No. 131) are also very pleasing.

Among the many works that arrest the attention of the visitor, those of Mr. Vernon Heath, London, stand conspicuously to the front. Wonderful in their subtlety of atmospheric effect and nicety of arrangement, they also show—what must be difficult on so large a scale—very superior skill in the embodiment of the various textures. In proof of this I may point to *Scour-na-Gillian, Skye* (No. 32), and *Giant Silver Firs at Roseneath* (No. 38), as well as to his other contributions.

I must likewise call attention to the very interesting works of Mr. W. D. Sanderson, of Manchester, who shows many large and very excellent pictures.

Out of four thousand works, all more or less excellent in the various branches of art, it is a matter of very great difficulty to discrimininate between one and another. I may safely say that in the whole collection there is not a work that the finger of indifference could be pointed at, and that is saying much. No doubt the influence that it will exercise on photographic art in general will be beneficial in the highest degree, in showing the great progress that is really being made not only at home but in distant countries, the beauty of which work cannot be too well spoken of.

Mr. Kareline, of Russia, Mr. Gutekunst, of Philadelphia, Herr T. Ganz, of Zurich and Brussels, and a host of other foreign artists, have sent productions that will do lasting credit to one and all.

As the Exhibition will shortly close* I shall take leave of it by expressing the satisfaction that all and sundry feel at its great artistic success, and the probability indeed that in every sense it will prove highly successful.

This Exhibition proves incontestably that retouching, except in the mere removal of spots from the negative, is frequently attended with fatal results. Were photographers *so prepared as not to depend* upon retouching, their work would invariably be of a higher class. In portraiture, especially, character and individuality would be maintained. I would also observe that blackness in the backgrounds is not an element of power; all backgrounds should have a slight feeling of atmosphere in them. In landscape art too much care cannot be taken in the selection of a subject, and combination printing may certainly be allowed, provided the parts are kept naturally together. People do not ask how such and such an effect has been produced; they judge of the merits of the picture from the results. These remarks may also apply to *genre* pictures, groups, &c. Those who have had the honour of waiting upon Nature know well how capricious she is, but it is just as certain that those who wait patiently do not wait in vain.

Alastor.

Meetings of Societies.

VIENNA PHOTOGRAPHIC SOCIETY.

At a meeting of this Society, held on the 19th December, the President, Dr. Hornig, laid upon the table an apparatus for filtering gelatine and isinglass, sent by Herr Höschl, and a very simple photometer, sent by Herr Friedleins.

The committee appointed to adjudge the Voigtlander and Society's prizes then presented their report, the result of which will be found annexed. It will be perceived that the committee did not feel justified, after testing the proposed amendment, in awarding the prize offered for an important improvement in the wet process to either of the two competing essays:—

The awards of the committee appointed to adjudge the prizes provided by the Voigtlander Fund and the Vienna Photographic Society are as follow:—1. The Society's bronze medal for the best collection of views of old monuments, to Herr A. C. Pitzek, of Frautenau. 2. The Society's bronze medal for a collection of *genre* pictures, to Herr Rupprecht, of Oedenburg. 3. The Voigtlander silver medal for a collection of a hundred lantern slides adapted for educational purposes illustrative of natural history, art, &c., to Herr Ganz, of Brussels and Zurich, whose productions were so highly commended at the recent exhibition at Edinburgh. 4. A Voigtlander silver medal to Dr. J. M. Eder and Captain Tóth for their essays, laid before the Society, on the iodising of collodion and on intensification with lead. 5. A Voigtlander silver medal to Herr Adalbert Franz, for his essays on zincography aad heliography. 6. A Voigtlander bronze medal to Baron Stillfried, of Yokohama, for a collection of ethnographic studies. The prize, a gold medal, worth one hundred and forty ducats, offered for an improved dry process was not awarded, neither of the two competing essays being considered worthy, but is again offered in the new list, the programme for the present being very similar to that for the past year. It is divided as before into two parts—that offered from the Voigtlander fund, and that from the funds of the Society, thus:—

Part I.—1. A gold medal, worth 140 ducats, for the increased sensibility of wet plates. 2. A gold medal of the same value for a strikingly sure and sensitive dry process. 3. A gold medal, worth forty ducats, for a thorough examination of asphalte (as employed in processes allied to photography). 4. A silver medal for a series of studies from nature. 5. A silver medal for a series of views of monuments. 6. A silver medal for a series of lantern transparencies as aids to the teaching of natural history, art, and technical subjects. 7. Medals in gold, silver, and bronze for scientific essays, inventions, and improvements in photographic matters which may be read before the Society or published in its organ.

Part II.—From the funds of the Society.—1. A gold medal for the production of high or low relief printing-plates in half-tone by photographic means. 2. A gold medal for a critical study of the reactions of chromic acid and its salts upon albuminate, albuminoide, carbonic-hydrate, and resin, with special reference to the various heliographic processes. 3. A silver medal for *genre* pictures. 4. A silver medal for carbon prints produced in Austrian Hungary. 5. A silver medal for a collection of views of architectural monuments. 6. A silver medal for a collection of enthnographical studies. 7. A silver medal for a collection of anthropological studies.

With regard to the programme for 1877, the committee recommended that that of the last year be re-adopted, with a few modifications in the details, and the addition of a new prize worth forty ducats for a thorough investigation of asphalte.

Dr. J. M. Eder read a paper on the investigation, by himself and Captain Tóth, of the iodising of collodion with aniline salts, which gave unfavourable results, yet which added to the systematic knowledge of the iodising of collodion.

Herr Fritz Luckhardt then laid upon the table three pamphlets on retouching, viz., Eugen Müller's, P. Piquepé's, and that of Burrows and Colton.

A long discussion followed on M. Scotellari's proposal that violet varnish should be used for studio windows, in the course of which

Herr Jaffè said he did not believe in any advantage to be derived from the use of violet curtains or glass; on the contrary, it was his opinion that white light must act more powerfully upon iodide of silver than violet light, since the whole is greater than the part. Photographers choose blue curtains because white would dazzle the eyes, and in actinic power the colour blue is next to white. Besides, a pure blue is produced both cheap and fast (in so far as it is permissible to speak of the fastness of a colour, since none can long withstand the continued action of the lights). How do matters stand with respect to violet? A fast violet is expensive, and does not nearly approach blue in actinic power—a circumstance easily explained by the fact that it is generally produced by the combination of blue and madder. Aniline violet is certainly as sensitive to light as pure blue, but it is very fugitive, so that curtains and glass coloured with it would soon change their appearance. It would be interesting to know how M. Scotellari proposed to produce a *fast* bright violet, as a *fast* colour only could be used by photographers. If he had discovered a way of doing this, then, indeed, he had done a good turn to science, art, and trade.

Herr Schranck stated that the employment of coloured curtains, glass, and screens had long been recommended. Herr Benqué, for example, recommended the use of rose-coloured screens for the production of certain effects; Herr Wendling used frames upon which blue paper saturated with paraffine was stretched. Herr Schranck also mentioned that, as far as he recollected, Herr Halleur placed coloured glass slides before the objective.

Herr Gertinger remarked that he had repeatedly used coloured screens, but had not found them very satisfactory.

Herr O. Kramer then showed a Japanese dish which, on account of the hardness of the varnish, he had found especially adapted for photographic purposes.

The question—"Has anyone tried eau de javelle, instead of soda, for fixing? and, if so, how has it answered?"—gave the Chairman an opportunity of explaining that this was a case of misapprehension. The eau de javelle is used *after* fixing, in order to remove the least trace of soda from the prints; but it is not used to fix with instead of it. He added, further, that the effect of the preparation was undoubted, but that it was soon spoilt by the action of the light.

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* This article was written ten days since. The Exhibition was closed on Wednesday last.—Eds.

Herr Riewel asked if any member present could explain to him how pieces of tissue cut from the same roll gave such various results.

The Chairman was of opinion that the variation might be caused by change of temperature during the drying, sensitising, &c., or some unobserved difference in the treatment, and that one was apt to undervalue thermometric observations.

This terminated the proceedings.

Correspondence.

THE HYDROSULPHITE OF SODA DEVELOPER.

To the Editors.

Gentlemen,—With satisfaction I have seen that you are pleased with the effects of the hydrosulphite developer, though you have experienced some difficulties.

You have found at an early stage of development a general veil on the negative. This never occurred with me, and I do not think that the veil is caused by the reduction of silver bromide, but by a *deposit* of double sulphite of soda and zinc, forming a crust on the surface of the film—something like the veil formed on dry plates prepared with the bath and washed with hard water.

As the double salt is very slightly soluble in cold water and quite insoluble in alcohol and water, I would suggest the use of a little alcohol added to the hydrosulphite solution just before use, and then filtered. Or dry hydrosulphite could easily be prepared and kept in stock, and, when dissolved in cold water, would form a very pure solution.

I do not recommend keeping hydrosulphite solution in the presence of zinc, owing to the liability of the former to decompose.

$$2\,(SO^2NaH) + Zn + O = Zn + Na^2S^2O^4 + H^2O.$$

Now of the density I can say that I obtained full printing negatives by this developer used alone. It is true that the process I use gives, very easily, intense films; it is Mr. M. Carey Lea's iodo-bromide unwashed emulsion process, with the following preservative:—

Strong infusion of coffee	250 parts.
Gallic acid	5 to 10 ,,
Acetic acid	5 ,,
Water to make up	500 ,,

I enclose an *experimental* print, in which you will see that the details in the whites of the background are not out (though perfectly visible in the negative), the foreground being printed dark. I hope, not being able to send you the negative, that this print will show its character.

As perhaps it may be interesting to you and to your readers to have an abstract of the theory on which the use of the hydrosulphite is founded, I send you some of my notes on the subject. [See page 41.]

Hoping that continued experience of the process will completely satisfy you,—I am, yours, &c., L. O. Sammann.

48, *Avenue de Bois de Boulogne, Paris,*
January 20, 1877.

INDIA-RUBBER SOLUTION.

To the Editors.

Gentlemen,—Some weeks ago I saw in your correspondence columns a letter from a lady photographer, in which she complained of the great difficulty she experienced in making a solution of india-rubber. Just about that time I was similarly situated. I attempted to make a solution for edging some emulsion plates, but, do all I would, I could not get the emulsion to dissolve.

Before reading the letter I had tried several samples cut from manufactured articles of various kinds. I also tried with some shreds cut from old packings that had been working inside a high-pressure engine cylinder, but all to no purpose. On reading the letter in the Journal in which you recommend that class which is used for rubbing-out purposes I at once procured some answering your description; but on mixing it with the solvent it refused to dissolve just the same as the rest of the samples I had tried. After some trouble I procured what I was assured was pure rubber in its raw state. I mixed some, and in a very short time it quite dissolved, and answers the purpose intended admirably.

From the little experience I have had, I come to the conclusion that the difficulties attendant on making a solution of india-rubber do not so much depend on the solvents employed (though I am well aware they are few) as upon the purity of the rubber itself.

I shall be happy to furnish your lady correspondent, or any of the photographic brotherhood, with a small sample of the rubber I have so well succeeded with, if you will kindly furnish them with my address.—I am, yours, &c., J. S.

Stockport, January 23, 1877.

Obituary.—We regret to have to record the death of Mr. W. G. Hunter—a gentleman well known by London amateurs as one of the photographic fraternity, having been for several years a regular attendant at the outdoor meetings of the Amateur Photographic Field Club, of which body he was a member. His death, which took place on Friday last, resulted from Bright's disease—a malady to which several photographers have succumbed, although there is nothing whatever in the habits or routine of the photographer to induce such a virulent complaint.

Emulsions.—We have received from Messrs. Wratten and Wainwright a sample of washed emulsion, which we have tested by the only practicable means at our disposal during the present dull and foggy weather, viz., by the printing of transparencies by superposition. For work of this kind it answers very well indeed, and we have not the least doubt that it will answer equally well for the production of negatives. We have also received from Mr. W. Gray, of Fraserburgh, a sample of gelatine emulsion, the *specialité* of which consists in its containing a large proportion of alcohol. It is somewhat slower in its action than other samples of gelatine emulsion with which we have been working of late; but, if we have rightly understood Mr. Gray, it was prepared rather with a view to its good keeping qualities than to an exalted degree of sensitiveness. This gentleman informs us that he has succeded well in emulsifying bromide of silver with meta-gelatine, and we hope to receive from him some further account of his experiments in this direction.

An Objectionable Photograph.—On Monday last, the 22nd inst., at the Leigh (Lancashire) petty sessions, James Doolittle, civil engineer, appeared to a summons charging him with doing wilful damage to a window at the shop of Thomas Roberts, photographer, Bradshawgate, Leigh, on Saturday last. The complainant deposed that the defendant called at his shop on Friday evening last and impertinently demanded the removal of a photograph of him from the window. Witness declined to do this, and next morning defendant again called and requested the immediate removal of the photograph, which witness again refused to do. Defendant thereupon left the shop, smashed the window with his walking stick, abstracted the objectionable photograph, which he took back into the shop, and then tore it to pieces.—The defence was that when he sat for his photograph it was stipulated that no copy should be exhibited. He strongly objected to the exposure of such a caricature of him.—Mr. Marsh (magistrates' clerk): Don't you think it was a satisfactory likeness? Defendant: By no means. (Laughter.)—Mr. Marsh: I never yet met with a person who was satisfied with his likeness. (Renewed laughter). —Defendant pleaded justification as his defence, and complained that Mr. Roberts had threatened to expose another copy of the photograph, inscribed "Doomore," parodying his name from Doolittle. (Laughter.) He could not walk about the town and be made the laughing-stock of everybody.—The bench ordered the defendant to pay the damage, 3s., and costs.

Edinburgh Photographic Exhibition.—In the *Scotsman* of Tuesday last we find the following:—It had been arranged that the Photographic Exhibition in the Rooms of the Royal Scottish Academy should close last Saturday evening, but through the kindness of the office-bearers of the Academy the promoters of the Exhibition have been enabled to announce that it will remain open till Wednesday. So far as it has gone, the Exhibition has, we believe, proved eminently successful. The daily attendance of visitors, considering the disagreeable weather lately experienced, has been extremely satisfactory, and the financial returns, amounting to close upon £500, will not only meet all the expenses connected with the Exhibition, but leave a considerable surplus at the disposal of the Edinburgh Photographic Society. The inmates of various institutions in the city have been admitted to the Exhibition on payment of a nominal sum; and on Saturday forenoon about 800 young ladies, belonging to the Merchant Company's Schools, also obtained access to the rooms at a reduced rate. Very few of the pictures on view have been sold—the value of the whole number disposed of not exceeding £50 or £60—but we understand the explanation of this is that comparatively few of the photographs exhibited are for sale. Had it been otherwise, there is good ground for stating that many of the more noteworthy contributions would have found purchasers at fancy prices. Indeed, we are told that a number of the pictures could have been disposed of several times over.

EXCHANGE COLUMN.

I will exchange a new oak writing-desk, worth £3, for a good bellows camera or lens, or anything in photography, and will pay the difference in cash. Address, James Edwards, Brora, N.B.

Bury's rolling-press, steel plate 18 × 12, planed iron bed, double geared, in exchange for backgrounds, furniture, or good magic lantern with 3½ in. condensers, or offers.—Address, H. C. Jennings, Queen-street, Norwich.

I will exchange a new porcelain dish 20 × 24 for a 10 × 12 watertight bath. Also a pair of good one and a-quarter inch stereo. landscape lenses, five inches focus, for a portrait lens.—Address, George Hadley, 2, Alexandra-terrace, Lincoln.

A Ross's 8½ × 6½ single view lens; Lerebours' *carte-de-visite* lens; half-dozen ½-plate print frames; and several other small things, tun-dishes, &c., in exchange for any good cabinet or card view lens, or camera, or anything useful, such as colours, &c.—Address, J. C., care of H. Watson, photographer, High-street, West Bromwich.

ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

NOTICE.—Each correspondent is required to enclose his name and address although not necessarily for publication. Communications may, when thought desirable, appear under a *nom de plume* as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

H. WATSON.—Have you tried the process described at page 487 of the volume for last year? If not, do so.

B. P.—We shall devote a few hours to an inquiry into the history of the affair, to which we shall refer in our next issue.

C. M. L.—Both classes of lens are good; but of the two we prefer the rapid form of that last mentioned in your letter.

J. S.—Thanks for the cutting and also for the enclosure, which we shall try. It is quite different from any that we have previously seen.

R. S. THOMPSON.—The lens mentioned is *not* free from flare—a fact of which we can readily afford you ocular demonstration if you will call with it at our office.

W. SHAW.—It is probable that the publication of *Studies from Nature* was discontinued; we certainly are not aware of any copies having been issued since we reviewed the last number in this Journal.

A. W.—In only one item is it likely that the hitch could have occurred, namely, in the cotton. After trying the new sample you have ordered please write again and inform us of your further experience.

HOPEFUL.—Such a pressure as that obtained from your screw-press is far from being sufficient. But it will be much more satisfactory for you to make a few trials, which, as you already possess a press, will only cost a trifling amount.

F. R. S.—Up to the present time no practicable burner for magnesium, which would render the light quite steady and at the same time consumes the dense volumes of smoke emitted, has been introduced in connection with the magic lantern.

H. A. S.—Bronzing of the silver image usually takes place when the strength of the sensitising bath is too great for the proportion of chloride in the albumen; hence, to prevent bronzing of the print, all that is necessary is to reduce the strength of the silver bath.

J. JENNINGS.—The process of engraving about which you inquire is based upon the Woodbury method of making relief-printing plates. If you choose to communicate your process, in confidence, we shall then be enabled to indicate if, or in what manner, it differs from the other.

J. STORR.—The best film for your purpose will be one of gelatine, the thickness being equal to that of writing-paper. After the picture has been finished upon the glass apply the gelatine, and when thoroughly dry it may be removed from the glass, carrying with it the film of collodion.

JOHN FORBES.—Enlarged negatives of great exellence may undoubtedly be produced by means of the sciopticon, using a paraffine lamp; but before this can be done it will be necessary that the flame of the lamp be rendered very small and intense. This also applies to every other form of magic lantern.

TURKO.—We cannot inform you whether or not there is a photographic journal published in Russia. We recollect that in the summer of 1867 one was announced to be published by Bergholz, of St. Petersburgh. Whether it was published, or, if so, whether it still survives, we are at present unable to say.

W. W. W.—The reason why the picture to be "enamelled" does not leave the glass is to be traced to the fact of an unsuitable collodion having been used. If a good, tough collodion be employed, the plate having been previously prepared as described in our article on this subject in last year's volume, the picture will, when dry, leave the plate with great facility.

W. B. N.—No really *new* lenses have been introduced since the article to which reference has been made was written. A doublet combination may be formed by mounting the two single aplanatic lenses in a tube; but, owing to their external form, a very small diaphragm will be required in order to secure flatness of field over an extended angle. Mount the lenses about two inches apart.

W. H. JAMES.—1. Any kind of tracing paper will answer. To strain it on a frame make it moist, and paste it to the frame before it becomes dry.—2. It is to be assumed that the process last described is found to possess, on the whole, greater advantages than that previously treated of; but we are unable at present to indicate in what relative estimation the two processes referred to are held by the author of the article.

T. R. P.—We have long been cognisant, and have also made our readers aware, of the fact of fading being induced in numerous instances by the bronze with which the mounts are ornamented. Your enclosures clearly indicate this to be the cause of their having become spotted. You have no redress unless you order that gold only should be used in the ornamentation of your mounts, bronze having, in fact, been employed instead.

A. I. C.—1 and 2. Our experiments with the Nicol prism were made in conjunction with a single landscape lens in which the diaphragms are placed in front of the lens, and with this form we experienced no difficulty in mounting the prism, which, in the cork casing in which it is always procurable from the dealer, is of a circular form. In your lens the best position will be immediately in front of the diaphragm. If you experience difficulty in procuring the prism we shall have pleasure in obtaining one for you.—3. For certain purposes the prism is preferable to the sky-shade.

D. JOHNSTON (Forres).—The photographs are excellent examples of good and careful manipulation; but more *technically* perfect results will be obtained by making use of a stop of such dimensions as will ensure more uniform sharpness—such sharpness, for example, as will bring the feet of the little girl with the basket to a nearer approximation, in this respect, to the hands.

THULIE.—They were not overlooked. Publication will be made when we next have occasion to make a similar acknowledgment. The only difference between Forrest's patent plate substitute and ordinary glass consists in the former having been subjected to a good polishing with rouge. The slipping off of the film must surely be due to the contractile nature of the collodion employed rather than to any peculiarity in the surface of the glass; but in the meantime it may be advisable to give the glass a coating of diluted albumen, which, acting as a substratum to the collodion, will effectually ensure its adhesion.

W. C. B., writing on the subject of residues, says:—"'Free Lance,' in your last issue, writing relative to my question about selling gold and silver residues (see THE BRITISH JOURNAL OF PHOTOGRAPHY, December 29) exclaims—'could it be believed that any one would be so unreasonable?'—namely to ask for an address where may be had a reasonable price for residues without having ascertained the value by melting. Perhaps to many others it seems not so unreasonable as to 'Free Lance' to expect that the proprietor of a business where are melted every week or every day residues all the year round should be able to name a price for them beforehand. Indeed, I myself have, for over fifteen years, sold to refiners at different places on the continent paper clippings and residues under this 'unreasonable' condition. However, to call anyone for such a question 'a querulous objector' looks very much as if this knight of the 'free lance' was also a man connected closely with the gold and silver trade, especially as he, in his valuable epistle, hints at all the gentlemen who wrote about the reduction of the prices of silver, honouring them with the same epithet."

☞ **Editorial Communications should be addressed to "THE EDITORS"—Advertisements and Business Letters to "THE PUBLISHER"—at the Offices, 2. York Street, Covent Garden, London, W.C.**

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SOUTH LONDON PHOTOGRAPHIC SOCIETY.—At the next meeting of this Society, on Thursday next, February 1st., in the Rooms of the Society of Arts, Adelphi, Mr. William Brooks will read a paper on *The Emulsion Process Applied to Transparencies, Enlarging, &c., Without a Nitrate Bath.*

◆

THE RAINFALL IN LONDON DURING 1876.

1876.	Inches.	Number of days on which rain fell.
January	0·58	5
February	1·90	15
March	2·54	15
April	1·35	8
May	0·87	5
June	1·02	7
July	0·57	6
August	1·93	10
September	2·00	21
October	1·88	12
November	2·59	15
December	5·86	21
Total for the year	23·09	140

Rain also fell on the first twelve days of the present month, amounting in the aggregate to 3·40 inches. J. H. STEWARD.

◆

METEOROLOGICAL REPORT,

For the Week ending January 24, 1877.

Observations taken at 406, Strand, by J. H. STEWARD, Optician.

THESE OBSERVATIONS ARE TAKEN AT 8 A.M.

Jan.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks.
18	29·87	SW	44	45	54	41	Dull
19	29·80	SW	52	54	57	44	Dull
20	30·31	N	45	48	59	46	Foggy
22	30·63	SW	37	39	45	35	Foggy
23	30·49	S	35	37	48	33	Foggy
24	30·11	WNW	44	45	—	34	Dull

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 874. Vol. XXIV.—FEBRUARY 2, 1877.

ON THE RECOVERY OF SILVER FROM EMULSIONS.

To many of our readers a further reference at the present time to the subject of residues may possibly appear in the light of an oft-told tale; but there are others who, we have no doubt, will welcome any hints upon the above branch of the subject which has not hitherto been specially treated, or indeed described at all, by any of the numerous writers upon general residues. It frequently occurs—especially with experimentalists and learners in emulsion photography—that large quantities of emulsion accumulate which, while useless photographically, are too valuable to be thrown away, containing as they do a very large proportion of silver nitrate. In spite of the richness in silver of these waste emulsions it has been alleged that the recovery of the valuable metal is not remunerative on account of the difficulty of extracting it from the collodion; but we can scarcely see in what respect the process presents greater difficulties than are experienced in the treatment of other forms of residues, though we can very well understand how, in the hands of a bungling manipulator or in the absence of proper method, the game may seem to be not worth the candle. By adopting one or other of the courses about to be described no difficulty and but very little expense will be met with, while the return of silver will be proportionately much higher than from ordinary residues.

The methods of treatment from which we have to choose may be divided into two classes—the dry and wet modes—the first of which is based upon the reduction of the metal by means of heat, while in the other case the change is brought about by chemical means. For the production of a pure product, and, indeed, for general excellence, the first-named method is much to be preferred when the appliances exist for its performance; but, as many amateurs cannot command sufficient heat to reduce silver in this manner, or do not possess the knowledge and skill, we shall give also an alternative method, which, however, it must be understood is inferior in results to reduction by heat.

Commencing with the emulsion in its ordinary fluid state, we have to consider the best means of getting rid of its organic constituents. Supposing the dry method to be the one it is intended to follow, we have first of all to separate the solid matter from the solvents, which is best done and with the least trouble by spontaneous evaporation. Should time be an object, it is possible to combine this with the operation next to be described by setting fire to the inflammable mixture; but as it is a troublesome and, even with the greatest care, a highly-dangerous proceeding, so far from recommending it we strongly advise our readers to avoid its adoption. The result of the evaporation is, of course, a sort of "pellicle," which, however, requires no subsequent washing; this may be allowed to dry spontaneously, or the process may be accelerated by the application of heat, after which we get rid of the pyroxyline, and reduce the organic matter to its simplest form. It would be obviously injudicious, to say the least of it, to apply heat to a substance composed partly of so explosive a material as pyroxyline in a closed crucible; hence the importance of this part of the process. If the decomposition of the gun-cotton be effected with full access to the atmosphere not the slightest danger is incurred; for the pellicle possesses, under such circumstances, no explosive properties, but merely burns slowly like so much moist gunpowder, leaving the silver bromide in combination with a considerable quantity of carbon in the state of a black cinder.

In order to secure this result, the pellicle, having been perfectly freed from moisture, is laid upon an iron plate or an old porcelain dish, and placed in the open air or under a flue, in order that the suffocating gases evolved during its combustion may be carried off; a match is then applied, when the whole will be rapidly reduced to a cinder in a few seconds without any exhibition of violence or explosiveness, the combustion being regular and gentle in the extreme. The residuum is then ready for the final reduction in the crucible in the ordinary manner, or it may be further purified in the manner to be described, though this is mentioned rather as a chemical phenomenon than as a necessary step in the process. If the charred remains of the pellicle be examined it will be found to contain an immense number of minute, semi-transparent globules of various shades of colour—from lemon-yellow to the deepest tint of amber; these consist mainly of fused bromide of silver. If the black mass be introduced into an iron spoon or, better, a porcelain crucible, and maintained at a bright-red heat for a few minutes, the whole of the silver bromide will be separated, and may be poured away in the fluid state from the infusible ash. This curious substance, while fluid, is of a rich, clear ruby colour, somewhat resembling bromine, and if poured on to a cold surface quickly solidifies into a hard "slag," having a metallic ring. It retains its dark colour for a short time after becoming solid; but gradually, or instantaneously, if moistened, it changes to a light yellow, which in turn gives place, under the action of light and atmospheric effect, to a dull grey. If a piece of the fused substance be broken it will be seen that the latter change of colour is entirely on the surface, for the fracture exhibits various shades of clear amber, according to the length of time which has elapsed since it was fused. Except so far as colour changes are concerned, it is unacted upon by water, nitric acid, or solution of hyposulphite of soda, and appears to be unreducible except at a temperature sufficient for the fusion of silver.

We now come to the final reduction in the crucible. To effect this the residue of the previous operations, whether in the crude or purified state, is reduced to coarse powder, and mixed with an equal weight each of dried carbonate of potash and borax and about one-fifth of the quantity of nitrate of potash also in coarse powder, and introduced a little at a time into the crucible previously raised to a bright-red heat. When the whole has been added the crucible is covered and the heat raised to the point necessary to produce fusion, and the operation completed in the ordinary manner. With respect to the time occupied in this part of the operation, it will be found longer than in the case of chloride of silver, especially if the crude residue be worked, in which case the quantity of flux may be slightly increased. It is for this purpose of facilitating the fusion that the saltpetre is introduced into the formula.

Those who prefer to dispense with the operation of fusing the metal, and are content to put up with a product slightly inferior both as regards purity and quantity, may adopt one of the following methods:—Pour out the emulsion to evaporate, as in the previous case, and, when set in the form of pellicle, cut it into small pieces and immerse in a strong solution of hyposulphite of soda until the whole of the silver bromide is dissolved. The latter operation is complete when the pellicle presents an uniform whitish, translucent appearance; the solution is then to be poured off and filtered. Or, perhaps, a better plan is to shake or stir up the emulsion with from an equal part to twice that quantity of strong hypo. solution; this will form either an opalescent mixture or a nearly clear solution, from which a flocculent precipitate is thrown down, according to the character of the pyroxyline contained in the emulsion. In either case pass the liquid through a filter, when the whole of the silver, or as much as it is possible to recover, will remain in the solution. Those who object to the too close association between the hypo. and silver may substitute for the former a sufficiency of strong liquor ammonia; but that mode of recovery will be found both more expensive and unpleasant, on account of the fumes given off.

Having obtained the silver in the state of solution, it is precipitated in the form of metallic powder by immersing a few strips of zinc or copper in the solution, the zinc or copper taking the place of the silver, which is deposited in the state of a black powder. Zinc is to be preferred to copper, on account of the tenacity with which traces of the latter cling to the precipitated silver in spite of repeated washing. When the whole of the silver has been thrown down the precipitate is washed in several changes of pure water, is afterwards treated for a few minutes with cold dilute sulphuric acid to remove any particles of zinc which may be present, and then again washed to remove the acid. Other precautions may be taken in order to secure, as far as possible, the purity of the silver; but as none short of fusion affords a promise of a really pure product we need not give them here. The washed silver is now ready for solution in nitric acid, and when dissolved a portion of it may be converted into carbonate with which to neutralise the remainder, as has been recommended, in order to secure a neutral solution without the trouble of crystallising the nitrate. The resulting solution answers perfectly for printing purposes, though we should not recommed its use for bath or emulsion work.

We hope these remarks may prove useful to at least some of our readers, many of whom we know look upon the recovery of silver from waste emulsions as a bugbear, while in reality there is no difficulty whatever in the matter.

NEW METHOD OF LIGHTING THE SITTER.

It would probably be saying too much if we asserted that success in portraiture depended mainly upon the manner in which the sitter is lighted, because there are several other conditions that must be fulfilled. But if all these conditions—including perfect manipulation, exposure, and immobility of the sitter—be secured the picture resulting may yet be a sorry affair in consequence of the imperfection of the lighting. By means of the illumination of a sitter the features may be rendered flat, or the projections of the brows may cause the eyes to have a sunken, cavernous effect, the cheek bones at the same time partaking in the exaggeration produced by injudicious lighting.

The proper method of lighting the sitter is a subject that must necessarily command at all times the careful attention of the photographic portraitist. Several artists have painted their portraits as if their sitters had been illuminated by a large pencil of light falling obliquely upon the face from an elevated angle. By "obliquely" we here mean that it is neither front light nor side light, but something between the two, directed from a point equidistant between pure top light and horizontal light, or say forty-five degrees.

Certain writers possessing, perhaps, a better knowledge of what is termed "art" than of practical photographic portraiture and its requirements have laid down as a principle that the light should be divergent; that is, that it should come from one point—the artistic point, which *has* dimensions, being here alluded to, and not the mathematical point, which has none. Among those who have advocated this mode of lighting is Mr. Vanderweyde; but that was a considerable time back. He then said, in an article in one of the Almanacs:—"In painting portraits the artist always places the sitter in a light which distinctly, yet softly, marks all the most delicate modulations between the deepest shadows and the strongest high lights, and he so arranges his curtains as to find a happy medium between a broad, diffused light, which would tend to flatten, and a contracted cutting light, which tends to hardness. Unfortunately, however, for photographers, especially of England, when they attempt to photograph with a contracted radius of light which a portrait painter would call perfection they fail, the light not being strong or white enough, and are obliged to broaden it, and consequently spread out the high lights, losing all those delicate half-tones on the forehead, along the lighter side of the nose, &c., the absence of which condemns any portrait, and often entirely changes the original character of the face and expression."

Since writing the foregoing Mr. Vanderweyde has apparently reconsidered his opinions on the effect arising from broadening or spreading out the high lights, and has obtained a patent for a method of lighting in which the light falls upon the sitter from an angle of considerable extension, which is equal, in respect of its artistic value, to the "broadening" to which objection was previously hinted at, if not definitely made.

The new method of lighting for which a patent has been granted consists in interposing between the sitter and the window a large lens by which the light is concentrated upon the sittter. In this lens there exists a difference between the form described in the provisional and that in the final specification; for, whereas in the former a plano-convex water lens is preferred, Mr. Vanderweyde in the completed specification adopts, by preference, the lens so well known to those acquainted with lighthouse mechanism as the "Fresnel annular lens." Still, as the former, or fluid, lens contains an "idea" we quote the description given of it, which is as follows:—"For the purpose of my invention I employ a water lens, plano-convex in form, and which may be constructed of two sheets or discs of colourless or slightly-tinted glass, of which one is bent of the proper spherical form, and the two fitted together in a suitable frame, and the intervening space filled with water or other liquid. Instead of being constructed of two discs of glass set in a circular frame, the discs may be composed of segments fixed in segmental frames, or the lens may be constructed of a number of separate glass vessels, each of segmental form, so that when fitted together a lens of the desired form is obtained; or the lens may be of solid glass." This, in effect, is the invention for which Mr. Vanderweyde has obtained a patent; but, as we have hinted, improvements upon the construction of the lens employed have been made in the final specification, and to this final specification we now direct attention.

The patentee, in his preamble, says that it is well known that portrait photography depends for the artistic excellence of its results mainly upon the power, breadth, and direction of the light by which the sitter is illuminated. It has been found by practice that the hardest and least suitable light for the purposes of portrait photography is light coming from a point, such as artificial light or direct sunlight or daylight coming through a small window, as the shadows in all these cases are hard and sharply defined. It is also found that ordinary daylight coming through a broad window or skylight, as used at present by photographers, produces softer effects, while very broad, white, sunlit clouds throw a light possessing superior actinic power and softness combined. Premising this, the object of the invention is to enable the same results to be secured with a dull grey, red, or blue sky as with broad, white, sunlit clouds, and the patentee attains this end by rendering the daylight both stronger and softer, as hereafter described.

The invention is also alleged to be applicable for rendering artificial light artistically desirable for the purpose of portrait photography. For this purpose Mr. Vanderweyde provides within the photographer's studio or room in which the photograph is to be taken a large lens placed between the source of light and the object or sitter to be photographed.

The lens preferred is a Fresnel annular lens of about five feet diameter, such as is used in revolving lighthouses; but other kinds of lenses might be used, such as a water lens, variously constructed. In any case the form of the lens must be such as to render convergent the rays of light entering through the window, skylight, or other opening opposite which the lens is placed or reflected from a mirror or other reflecting surface illuminated by daylight or artificial light, and used in combination with the lens. The effect of these converging rays falling upon a person placed within their focus is twofold, viz., a great increase in the whiteness or actinic power of the light by reason of the rays being concentrated towards a focus, and greater softness in the effects produced by reason of the light falling at varying angles upon, and thus embracing, so to speak, the sitter. This soft and brilliant light composed of converging rays has never, says the patentee, before been used for the purposes of photography.

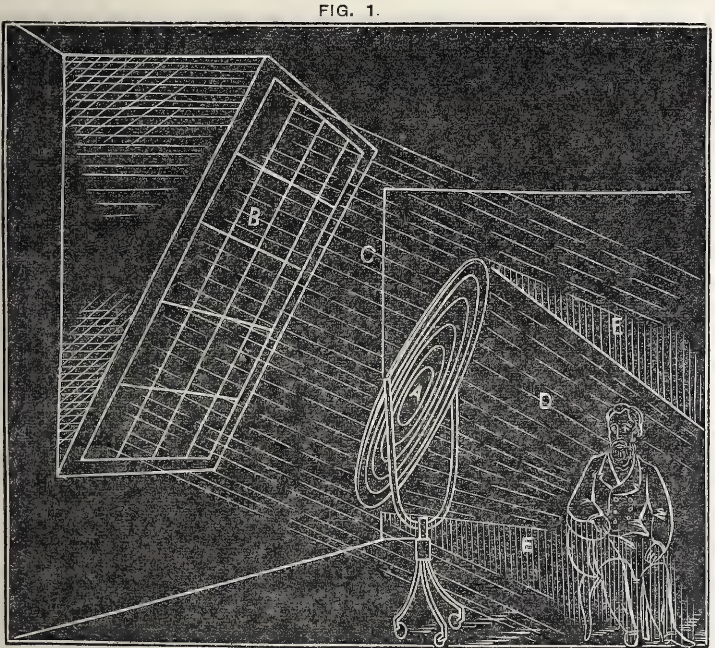
The light being condensed or concentrated as above described, the great objections (*i.e.*, hardness and want of actinic power owing to the divergence of the rays) to artificial light, such as the electric or magnesian light for photographic purposes, are stated to be obviated by this invention, the result being more delicate and softer modelling and shorter exposure. Artificial light thus becomes henceforth a practical and desirable means of illumination in portrait photography.

The specification is illustrated by three diagrams, which we reproduce, and also the description which accompanies them. This we give in the language of the patentee:—

"In order that my invention may be more readily understood I will proceed to describe it with reference to the accompanying drawing, in which I have shown diagram views of the invention applied in different ways.

"*Fig.* 1 represents the interior of a room or photographic studio. A is the annular Fresnel lens mounted to swing on gudgeons in a convenient portable frame. This condensing lens is placed opposite the window or skylight B, so that the light entering thereat will fall on the lens as represented by the parallel rays C, which on passing through the lens A are refracted and caused to converge, as at D, towards a common focus, between which and the lens the sitter is placed, as shown. E represents the annular space surrounding the cone of rays D, which has been deprived of the light which has been refracted towards the focus.

FIG. 1.



"The form of lens which I prefer to use will be seen by reference to *fig.* 2, which shows a cross section of an ordinary annular plano-convex Fresnel lens. Such lenses may be conveniently made, for the purposes of my invention, by casting the glass in moulds, and afterwards submitting the angular surface to the direct action of a furnace until the surface runs and becomes smooth and glossy, thereby avoiding the expensive operations of grinding and polishing, except upon the plane side. Each annulus or ring of which the lens is composed may be cast in segments and joined together.

"*Fig.* 2 represents a studio on the ground floor or basement. A is a lens as before, and F a reflector placed at such an angle as to reflect the vertical rays from the sky through the window B on to the lens A, by which they are concentrated towards a focus as before.

"*Fig.* 3 represents an arrangement for applying artificial light. A is the lens, and G is a paraboloidal reflector, in the focus H of which the source of light is placed. The light used may be the ordinary electric or magnesian light sometimes used in photography. The reflector G may be made of sheet metal, silvered on the internal surface. The divergent rays from the light at H are reflected in a parallel direction on to the lens A, by which they are made to converge as before. A sheet of tissue paper, or ground glass, or similar medium, might sometimes be advantageously introduced between the source of light and the lens for the purpose of softening the light."

FIG. 2.

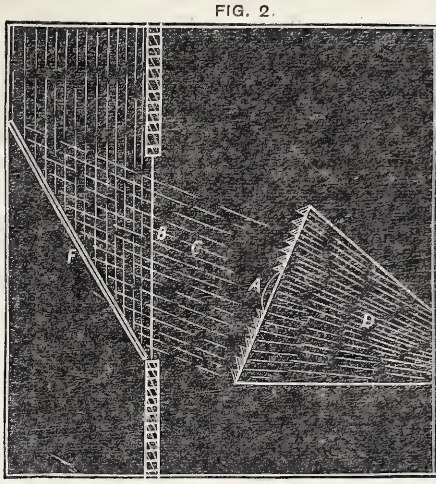
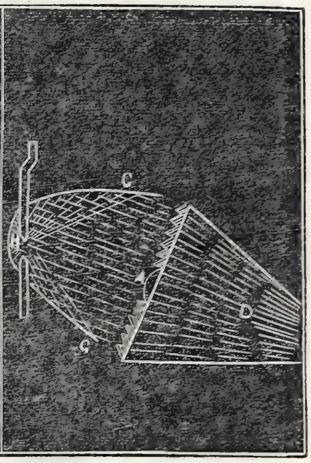


FIG. 3.



The special claims made in connection with this invention are the following:—

First.—The application and employment in portrait photography of a lens, as described, for concentrating the light by which the sitter is illuminated during exposure, as and for the purpose herein set forth.

Secondly.—The employment in combination of a lens and reflector, substantially as described, for concentrating the light, whether natural or artificial, by which the sitter is illuminated in the process of photography, as set forth.

As we have not yet seen any specimens produced conformably with this mode of lighting we abstain at present from offering any comments upon the apparatus, or venturing on any prediction as to the probability of its success.

◆

We have continued our experiments with the hydrosulphite of soda developer since we last wrote concerning it, and we find that perseverance, as in most other pursuits, is gradually removing the difficulties which at first beset us. What we have now to record is entirely of a practical nature, bearing upon the details of preparation and manipulation, which maturer experience has led us to modify to a slight but not unimportant extent. We may say that now, though we are not yet able to attain the same amount of density as with pyro. and ammonia, we can secure quite sufficient for any practical purpose, and that with a better gradation of light and shade and without the tendency to heaviness in the half-tones which marks intensification with alkaline pyro. We were at first inclined to attribute to the new developer longer keeping properties than M. Sammann claims for it, but careful observation proves that, though its power remains for considerably longer than the twenty-four hours mentioned by that gentleman, the action is of so inferior a character as to fully justify his original statement. The developing power exhibited by the sulphite and bisulphite of soda in conjunction with pyro., which we noticed in a previous article, is not, we have now reason to believe, of practical utility; for repeated trials, under all the conditions which practice has taught us conduce to success, with the hydrosulphite fail to produce a sufficient improvement in the result to hold out a hope of ultimate benefit. It is of importance that the hydrosulphite solution be *not* left in contact with the zinc for a longer period than is necessary to complete the reaction; for, although an immediate change is apparent, we find that an action is set up which acts very injuriously upon the quality of the development. If left in contact for two or three hours a copious precipitate forms, probably the double sulphite spoken of by M. Sammann, which renders filtration a necessity, weakens the developing action, and entirely destroys all chance of securing sufficient density in one operation. It is advisable, upon pouring off the solution from the zinc, to wash the latter thoroughly with two or three changes of water, in order to remove all traces of hydrosulphite and prevent the formation of the precipitate which would otherwise occur and spoil the next batch of solution. We have slightly modified our method of using the developer. Instead of diluting the hydrosulphite with an equal quantity of water we substitute for the latter ordinary methylated spirit, and apply it to the film without previous wetting. In this manner we secure a clearer development, and the density is more easily reached. Should the alcohol cause a *cloudiness* in the solution it does not appear to matter; but if a decided precipitate be formed it should be filtered out. We may say, in conclusion, that the more we use the hydrosulphite the better pleased we are with its action.

ON PHOTOGRAPHING CHILDREN.

As a pendant to my remarks on quick exposures in the studio, I may be permitted to dwell a little on the class of work for which such exposures are most suitable: I mean babies and young children—the great bugbear of many a poor photographer's life. I speak advisedly in so terming them, for I have come across many clever workers to whom the very thought of taking a baby's portrait was distressing, and yet how very unnecessary! Patience and tact (and what successful operator does not possess these?), and I think I must say some fondness for the little innocents, are all that is necessary in a fairly-lighted studio to ensure a pretty uniform degree of success, though, naturally, many occasions may arise when the most patient and skilful of men cannot command success.

But these occasions should not daunt—they should lead to renewed efforts; and after a slight apprenticeship to this branch of one's profession it becomes very interesting and attractive. It allows the fullest scope to one's fancy and invention in arranging poses, and one's skilfulness in controlling chemicals and taking advantage of the best light. A well-executed child's portrait is perhaps the most beautiful thing our art is capable of accomplishing, and, what to many minds would be above all, it brings in the most "grist to the mill."

It is my custom always to make an extra charge for babies and young children. I find no difficulty in obtaining it. I may say they come, or, rather, are brought, at all ages, from a fortnight upwards, and I am never afraid of them. I once had a very graphic account given me, by one of my assistants, of the method of procedure adopted at one of the places he had been at previously. Little trouble was taken about arranging the infantile sitter; it was propped in a chair and one plate tried upon it. If good—and a very small share of success served to satisfy—the matter was ended, and the nurse or mother bowed out; if bad, a series of dummy slides—that is, dark slide without any contents—were brought forward, and the pantomime of exposing and uncapping gone through with the utmost gravity. Then the money was taken, and in a day or two the sitter was apprised that another sitting would be required. Apart from the dishonesty of this style of thing it is unwise, for I find a very large proportion of the grand total of my sitters are little folk; and if I were to knock them off the list I should directly find my income materially modified, while indirectly I should lose still more, for in the train of children's pictures usually follow numerous commissions for enlargements, &c., and various coloured work.

With regard to how to do it. The light, of course, is of prime importance. With the exception of a slightly projecting screen overhead the lights should be all uncovered, to obtain all the light possible; for it will be remembered that the soft, round face of a child will look well in almost any light. I do not mean to deprecate any exercise of talent in arrangement of light, but merely to say that with no arrangement at all it will be possible to obtain excellent results. I have on more than one occasion described my method of lighting, so that I need not here refer to it again. When using the maximum amount of top light it will be found an advantage to throw on the floor a white screen or sheet to illuminate the too deep shadows a great excess of top light would produce. The light from the south, when very strong, may be modified by a screen of light calico or tracing cloth, and not allowed to arrive too near the floor, or a very awkward spot of light is given to the eye nearest to it, which imparts an effect like squinting. I also make it a rule never to take children's pictures "by the instantaneous process," except on very bright days, and between eleven and one o'clock.

I discourage to the utmost of my power the taking of groups of children; because although such pictures when successful are the most interesting of all, yet, on the whole, complete success with them is so unusual that it is quite worth while risking giving offence rather than sending out work which is not creditable. To carry this out I arrange a scale of terms almost prohibitive. I should also mention here that I encourage making appointments for the little people as well as their seniors; it saves much trouble.

A very important consideration is the dress children wear. There exists unfortunately a partiality on the mothers' part to clothe their pets—when they are brought to be photographed—in black velvet, which is a material I strongly object to, as the minimum of exposure being so commonly the rule, it rarely allows the drapery to come out as anything beyond a mass of black when the face and features are fully impressed upon the plate. Lighter drapery, too, has another great advantage—it throws up or reflects so much light as to entirely alter the character of the shadows. Just as in adults, glaring patterns should not be allowed, light materials (with "sleeves and ties" not too pronounced in size) being recommended.

As a rule fond mothers wish to have standing figures; but I set my face relentlessly against them. There is so much more risk of motion, and the feet are usually so much in the shadow as to come out either quite black or with no definition at all, and, beyond all this, sitting or lounging positions afford much more scope for pretty poses. The head-rest I rarely use with the youngest members of the community.

The all-important point—the method of treating the young strangers—occupies the most prominent place in the consideration of this subject, and here the operator will shine or ignominiously fail. Tact and experience should tell him what to do, but I am half inclined to believe that a successful general in this direction is born to the work; nevertheless, it is possible to give some hints that may be of service.

It is an oft-repeated story that children and dogs can tell who are fond of them and who are not. Without stopping to inquire how far it is correct, it is, without doubt, true that the little ones possess a considerable amount of penetration, and some of them require great management to avoid sending them into "tantrums." Upon the first entry of a child with its nurse into my studio I studiously avoid taking the slightest notice of it, neither speaking to it nor looking at it. Its confidence must be obtained gradually, and must be obtained somehow, if there is to be much chance of success; and, further, it should, if possible, be made happy, if not merry. I generally succeed in raising a laugh before it is in my presence five minutes, and then we get along all right, my aim always being to obtain portraits with pleasing expressions.

To return to the child's first entry into the studio. I address myself to the nurse or mother and introduce the subject of toys, of which I always keep a multiplicity of all kinds, suitable for all ages. I do not hesitate to sit on the floor by the little one's side, and enter into a confidential confabulation about his or her toys and their likes and dislikes in the matter. It need not be supposed that much time is thus wasted; far from it. I often spend several minutes thus getting into a child's confidence; take several negatives, and finally send her away pouting at losing her new friend and his toys, all in a quarter of an hour or twenty minutes.

I must conclude with a hint of one thing specially to be avoided, and that is the style of thing so splendidly portrayed in the pages of *Punch* a few months ago—a number of friends and relatives assisting in attracting the sitter's notice to keep it still. I allow no one to entertain the child but myself, unless I specially ask them; and though I do not care to have many in the room, I do not prohibit company entirely if only they keep quiet.

G. Watmough Webster, F.C.S.

VIOLET GLASS FOR STUDIOS.

In our number for December 22nd, and in other numbers, we have given details of M. Scotellari's experiments with violet glass for the glazing of studio windows. Writing upon this subject in our Philadelphia contemporary Mr. Thomas Gaffield, of Boston, says:—"I notice in the December *Photographer* that Professor Stebbing, of Paris, with whom I had some pleasant interviews in that city in 1872, calls attention to the attempts of an Italian, named Scotellari, to make the members of the Photographic Society of France and the photographers of Paris believe that violet glass is superior to white or colourless glass for the glazing of studios.

"I have only to say that such a claim is in entire contradiction of all my experiments for the last nine years with colourless glasses of many kinds and glasses of all colours. My experiments have all been made with paper sensitised with chloride of silver. The poorest kind of colourless glass, and even those kinds which have been changed to a yellowish or purple tinge by exposure of years to sunlight, will transmit a much larger amount of the chemical rays than the most actinic of the really coloured glasses—the blue and violet.

"I have never made any experiments with iodide or bromide of silver, and I shall not have time with my present occupations to make any before the publication of your next number. I have no idea that any different results will be attained, and I have not seen any photographer in Boston who 'takes any stock' in the so-called 'invention,' which is said to be patented in France.

"I would like to add that in a series of photometrical experiments, made by professor Frederic E. Stimpson and myself in 1867, we found purple or violet glass to cut off about ninety per cent. of the light rays. I have never yet expressed in mathematical terms the amount of chemical influence cut off by coloured glass; but I should think that violet glass would transmit from twenty-five to thirty per cent. less than any colourless glass.

"Under the circumstances, it is difficult to conceive of the remarkable effects named under violet glass.

"As Professor Stebbing says:—'The fact is, an error is committed by him, or that iodide and bromide salts are more sensible to violet rays than chloride of silver, with which the experiments of Mr. Gaffield were made. I think it would be well for some competent person to seek the truth, for it interests the whole photographic community.'

"I do not pretend to be the 'competent person' suggested by my friend Professor Stebbing; but for my own gratification, and as soon as I find opportunity, I hope to make a few experiments on iodide and bromide of silver, under colourless and coloured glasses, and will communicate the results to you."

CARBON PRINTING.

[A communication to the West Riding of Yorkshire Photographic Society.]

There have been so many and such ably-written articles on this subject that there appears to be very little room for me to say anything; but if you will give me your attention I will try to throw out a few hints that, at the least, will bring about a discussion from which we may all profit.

When a man first starts carbon printing (and there are a great many have started who at first cried the process down) he must determine within himself to overcome all obstacles and failures, of which he will find a great many; and he must bear in mind that it is only by practical working, day after day, that he gets to understand the process thoroughly. You must not begin by falling out with your materials until you have given them a thorough good trial, for in nine cases out of ten you are wrong and not the materials. Your tissue may dry unevenly, or be insoluble altogether, if the room you dry it in is not in a proper condition. A room with a current of dry air passing through it is the best. You do not require heat, although in wet weather you must have a little. You can get the desired current by placing a ventilator, having a revolving top, in the roof of your drying-room. You will find by this method of drying that your tissue will hang straight from the lath you pin it to and dry evenly, not curling and cracking as it is sure to do in an over-heated room, or where a great fire has been left burning. If you have only one piece of paper to dry, tie a piece of string across the mantelpiece and hang the tissue in front of the fireplace so as to get the current of air that passes from the doorway up the chimney. There is yet another advantage from the tissue being dried in this way: it is more sensitive than it would be if it had been dried rapidly.

Sensitise in a solution composed as follows:—

Bichromate of potash	3	ounces.
Water	100	,,
Ammonia	½	drachm.

The waxing solution is composed of five grains of wax to the ounce of benzole. Care must be taken that the wax and benzole are both pure; if they are not, your prints will be so very fond of the glass that they will not leave it. A plate that has once been used does not require cleaning again, but only the collodion scraping from the edges, and re-waxing.

To develope always use two baths. Immerse the plate in the first with water just warm enough to remove the paper from the printed pigment; then you may pass your plate to the next bath, the water being a little warmer, to finish the picture; but take care not to hurry the development, or you will lose the half-tones and get chalky prints. It is better to over-print a little rather than under-print, as you can reduce with hot water; but you cannot add to the density.

After fixing, drying, and transferring let your plates remain under pressure between sheets of blotting-paper for an hour or two at the least. I generally leave mine for four or five hours to absorb the moisture from the transfer, and to prevent the transfer-paper moving during mounting, as it is apt to do if you mount too quickly after transferring.

I mount in the evening and leave the plates under pressure until the next morning. I then rear them up to dry, taking care that the room be not too warm, or else they will leave the glass before they are thoroughly dry, and will, of course, have an uneven surface. To obtain an even and highly-glazed surface the prints should be from thirty-six to forty-eight hours drying. I find that the longer they are drying the higher the gloss and more even the surface. Not that, personally, I like very highly-glazed pictures, but the public do; and as they have to pay for them it is, of course, to our advantage to try and get it, and so please them.

Now for the last, but not least, of the difficulties of carbon printing, viz., vignetting. This at the best is a difficult task, and requires much practical experience, as you cannot look and see how the picture is going on as you can do in silver printing; but with a negative having a light and suitable background you can get a very good vignette with brown paper and cotton wool, having a little piece of tissue paper over the brown, the same as in silver printing. You must, of course, move the frame about a good deal, because carbon prints are so much sharper than silver. For large work cut out three or four shapes a little larger than one another—say an inch and a-half; take off the smallest when the picture is about half done, the next later on, and so on until the picture is printed, and you have the size you want. You may in this way get a very soft vignette

In conclusion: I would say the process is so thoroughly practical that any photographer should be able to work it, provided he gives his mind to it and has proper convenience and premises. If he have not the latter he had better leave it alone, for it cannot be worked commercially in a sink, with one or two porcelain dishes and a kettle, and paper dried in the operating-room, or in a room where a great roaring fire has been kept all day. This process is of great value in dull weather like the present, as you can do from fifty to one hundred per cent. more work than in silver, with the crowning advantage of all, namely, your prints are permanent.

T. R. Braybrook.

NOTES ON PASSING EVENTS.

By a Peripatetic Photographer.

What a fund of information on technical subjects is about to be placed at the disposal of the public, now that the Photographic Society of Great Britain is going in for discussions instead of papers at their meetings! But, if we are to judge of the future efforts by the last attempt at a discussion, it will promote the credit of that Society if a vigorous attempt be made to stamp out such discussions; for never in the history of photography has a mouse of such puny dimensions been associated with the maternity-efforts of a more pretentious mountain. When "boiled down" the residue amounts to this—carbon printing is an excellent thing, but unless in the hands of a few who possess the silver key to the proper padlock it is a failure. Now, this "finding" is quite incorrect; for, prior to the advent of the French apostle of carbon, pigment prints of a very fine quality had been executed, and executed, too, with commercial regularity, by such persons as cared to put themselves to a little trouble in connection with the pigmented tissue necessary in the process. Be this as it may, the photographic public have not been made much wiser with respect to carbon printing by the recent discussion upon the subject.

From a statement reported to have been made at the Berlin Photographic Society, one would infer that the old hypo.-toning bath still finds favour in that city; for, in the course of a discussion on blisters on albumenised paper, and the influence of the fixing bath in producing them, one speaker averred that "he added fresh soda to the fixing bath every day." In this country the best printers *make* a fresh fixing bath every day, and do not content themselves with strengthening an old one by a daily addition to it of fresh soda. That an old or, at any rate, a previously-used fixing bath will cause a print to take rich, dark tones is well understood; but it is, or ought to be, equally well understood that toning by means of an old hypo. bath is certain to produce prints that will fade with alarming rapidity, and for this reason fresh fixing baths ought invariably to be employed.

I usually read and profit by the reports of discussions at the meetings of the various societies as reported in this Journal; but sometimes I find it no easy matter to understand what is aimed at by the speakers. A case of this kind arises in connection with the last meeting of the Chicago Association, in the course of which a member said that "he used gelatine to get rid of the water in the collodion, and still there would be pinholes." The idea of enticing the water out of the collodion by means of gelatine is a happy one, and is, doubtless, an improvement upon the use of carbonate of potash, so long employed for a similar purpose in connection with alcohol; but, so far as I have been able to ascertain, the pinholes do not derive their existence from water in the collodion, but arise from salts that are formed in the nitrate bath.

The medal awards made at the Edinburgh Exhibition, as usual in such cases, appear to have failed in giving entire satisfaction to all parties. This can hardly be wondered at, seeing that the jurors have varied some of the conditions under which the Society invited the public to compete. I can imagine one of the exhibitors who did not receive a medal putting this question:—"Seeing that similarity to the style of Sir Joshua Reynolds is a recommendation in the judgment of the jurors, why was it not so stated in the printed conditions, so as to enable competitors to make themselves acquainted with the mannerisms of that painter?" Is not this of a piece with the teacher at the dame's school, who placed a little girl at the head of her class because she read her New Testament lesson with a twang that reminded her (the teacher) of her grandmother? Nor would the comparison be devoid of force.

Carbon printers who have been troubled by the reticulation of their pictures have good cause to be profuse in their gratitude to Mr. E. W. Foxlee, who has run this annoyance to earth. I myself have never been troubled with this reticulation, probably on account of the slow rate of drying to which my tissue is subjected. My practice has been to sensitise it at night and suspend the sheets, by means of pins at the corners, to shelves in a dry cellar, but one in which there is no current of air. In the morning I find the tissue quite dry. It is doubtless owing to this slow drying that I am enabled to record my unacquaintance with reticulation.

The days of "prunes and prisms" have not yet departed, or, to speak with greater accuracy, they are still advancing, and have now embraced photography in their grasp. It will be remembered by those acquainted with Dickens's creations how that Mrs. General, who had been engaged by Mr. Dorrit to look after the education of his daughters, enjoined the pronunciation of "prunes and prisms" as fitting exercise for the muscles of the mouth, in order to educate that expressive feature so that it should possess a particular character and convey a certain idea. I find that this kind of lingualistic education is now being adopted by certain photographers (in America, of course) to give expression to the mouths of those who court the aid of the camera for transmitting their lineaments to posterity. "It is said" that in some of the galleries of our transatlantic brethren there is hung a list of words which are to be pronounced by sitters who desire to adopt certain expressions when being photographed. Each word produces a certain expression, by keeping the lips in the shape into which they subside after the last pronunciation. The word "brush" causes a noble and distinguished expression of countenance if the cap of the lens be removed immediately after the word has been pronounced in a low but audible tone. The strong little word "fib" utilised in like manner reduces a large mouth into a small one. The transatlantic term "kerchunk" imparts a mournful solemnity to features which but for this verbal talisman might seem as if boiling over with mirth and gaiety. The idea is at least novel, if not excellent, and is capable of indefinite extension.

(To be continued.)

IMPROVEMENT IN LICHTDRUCK.

The new use of the mixture of silicate of soda or water glass with albumen* should certainly offer great advantages, and very much simplify lichtdruck. The plates are very durable and almost indestructible. Further: the first preparations may be made at any time of the day or by night light, and a great stock laid aside. I have only to alter my former instructions in so far that I pour on a little less water, so that the fluid is thicker, and the plates on the upper edge, where they formerly began to dry, now seem to be sufficiently prepared.

Take of albumen seven parts, of water glass five parts, and of distilled water five parts. One part of dry albumen only should be taken instead of seven parts of fluid, and the corresponding addition of water increased to six parts. Should anyone, however, prefer my former preparation he is recommended to coat the plate twice, and the second time to let the solution run off at the opposite side from that at which it ran off at first; but that I consider too troublesome. The above treatment remains the same as that given in my former article.

With regard to the pouring on of the gelatine I have hit upon a substantial alteration. For example: there are often small sunk spots that one cannot avoid when drying the plates. Such spots always print as black places, and destroy the purity of the pictures. These flaws are caused by the cracking of small, almost invisible, blisters during the drying, the place of which does not fill up, as the drying, having progressed so far, has already partly hardened the gelatine; they therefore remain as small, round, sunk points, containing no gelatine, and, therefore, ready to take up the more ink. This is a fault that I have seen in the productions of every operator. It may, indeed, be avoided if boiling water be used for the gelatine solution; if one, besides, keep the solution hot and skim off all air-bubbles and remove the skin which forms on the top of it; and if one proceed with great precaution to the spreading of the fluid upon the plate, by pouring on a considerable quantity of the fluid, spreading it slowly by means of strips of paper, then pouring it all off, and pouring on as much of a fresh solution as will remain when the plate is quickly turned round. By this method of manipulation clean plates are got; but it is only by long practice that equal films can be obtained, and then one never knows the quantity of solution likely to be required for a plate of a certain size.

A much surer way is to pour a quantity of spirits into the gelatine solution, and to lay the plates obliquely—say at an angle of ten degrees—in the drying box to dry; only, when dry, the plates must again be coated with the same solution, and then laid so that the side or end formerly uppermost is now undermost. The drying should take place at a temperature of 45° C., and before being coated the plates should be brought to this heat in the drying box; the box should then be quickly opened, the plates taken out warm, and rapidly prepared, the solution poured on and off again, and the plates replaced in the drying-box before they have had time to cool. They will dry in about half-an-hour. In the same rapid mode the second coating of gelatine must be dried. In this way only two plates at a time can be dried, because the frequent opening and shutting of the door of the drying-box tends to lower the temperature in the box too much; but as two finished plates are thus got every hour one really produces quite as many, if not more, than when several are dried at the same time, which are only ready in about three hours.

Another weighty argument for the double coating of the plate with the gelatine solution is based upon the construction of the drying-box and the organisation of the plate itself. As is well known, the plate must be placed with great care in a horizontal position, and fixed so by means of adjusting screws; but that is easier said than done. Because, in the first place, no plate is perfectly even—a fault most evident in large plates; secondly, if the levelling is to be properly done, not even a speck of dust must be under the water-level; thirdly, the iron rods upon which the plates rest expand and bend as the temperature varies, so that a plate placed perfectly correct loses its horizontal position while drying; lastly, the wood dries up and shrinks (it is in consequence of this that the box often makes the crackling noise heard while the drying proceeds), and thus often changes the horizontal position of the plate. But if the plate be not perfectly horizontal the gelatine accumulates upon one side as a somewhat thick film, and the picture upon this side will be light, while on the opposite side, where there is less gelatine, the picture will be dark. I have never been able to obtain absolutely equal large plates; in medium-sized plates, even, the inequality is visible, so that the middle of them can only be used for considerably smaller pictures. But with the double coating matters are more favourable, and I believe that when this improvement comes to be generally utilised considerably more use will be made of lichtdruck.

A gelatine solution, to which a quantity of spirits has been added, flows over the plate, like collodion, causes no blisters, and on being poured off leaves behind it a surface as smooth as a mirror, which it would be quite impossible to produce without spirits.

The solution is prepared as follows:—Six parts of fine gelatine are laid to soak in forty-eight parts of water, which need not be distilled. When swollen in the water bath it is brought to the boiling point, and one part of bichromate of ammonium is added to it, and then pour in forty-eight parts of common spirits of wine. Now stir round until no more bubbles are formed, filter through felt paper or a rag, and use the solution warm. It is as well, when required for farther use, to keep the fluid warm in the drying-box by pouring it into a bottle, and inserting the stopper in order to prevent the spirit from evaporating.

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* Described in our last volume.—Eds.

The pictures upon plates prepared in this manner are as fine in texture as photographs, and extremely clean. But a good printing plate should have a grain over all its surface, especially in the clearest places. This grain is produced by pressing the water used for damping into the gelatine, and goes on at the same time as the printing. Plates which are not granular enough in the shadows get clogged up with ink, consequently take up no water; and thus at the third or fourth impression the picture has become flat in the shadows, and must be washed with turpentine in order to make it absorb water again. Such plates are not serviceable. A beautiful grain is the easier to produce; the higher the temperature was at which the picture was dried, the more chrome salt there was added, and the roomier the drying apparatus was. Yet in these matters there is a certain limit beyond which one may not go. More chromic salt would crystallise; too high a temperature would decompose the salt in presence of the other substances.

With regard to the colour suitable for printing the plates: amongst those usually employed as additions to lampblack, madder only is excellent. All others—carmines and lakes—are, on the other hand, more or less objectionable. But madder is dear, often adulterated, and does not go very far; so that I was obliged to look out a cheaper colour which should also be stable. It is the *dark iron violet.* There is also a light iron blue, but it does not give strength enough, so that the former only appears usable. It goes a long way when rubbed down with lampblack, and gives a splendid purple-violet tone. It does not discolour the gelatine film of the plate, like lake and carmine, and is not liable to be changed by the action of light and other external influences. J. Husnik.

—*Photographische Correspondenz.*

ON PHOTOGRAPHIC ATMOSPHERES.

The discourse by which Professor Tyndall opened the series of conversaziones this year in the Royal Institution of Great Britain had the startling title of *Combat with an Infected Atmosphere.* This proved to be a continued examination, with most critical experiments, to support the views he had advanced for years past that there is no such thing as spontaneous generation, but that cases of decay and growth of fungoid matter proceed from pre-existing germs so minute and so widely diffused that it is difficult to find the air—of buildings especially—to be free from them. He had proved that a ray of strong light seen in a box or room is due to light reflected from these myriads of floating atoms; in fact, in pure air the light cannot be seen. The strongest light of the sun or the electric light traverses pure air, which appears perfectly black; but the moment such air contains foreign matter then the rays of light become visible—sometimes with a beauteous blue or opal-like appearance. To get pure air Professor Tyndall has pointed out the ready, practical methods—to filter the air through prepared cotton, to destroy the germs by heat, or to let a portion of air be enclosed so as to be free from currents, and then the germs, after some time, will fall to the bottom on any substances; and if these be (say) infusions of hay, fruit, &c., prone to decay, and the turbid changes show by the microscope bodies whose form and behaviour have been well studied, the whole becomes a mass of corruption, while the "black air," or that which has been freed by falling down of separating particles, has no power to change the same fluids—they remain perfectly bright and free from *Bacteria,* while the infusions exposed to common air become masses of corruption. Professor Tyndall, in repeating his experiments, got variable results. Sometimes the solutions set up changes when he thought his arrangements perfect; but he found when he worked in rooms where the air was loaded with these germs that it was scarcely possible to get constant results. Thus a minute aperture, or the currents produced by introducing liquids into vessels, would be sufficient to interfere, and bacterial fermentation ensued.

Now, the practical photographer in every country has made his complaint of the effects of dirt, the annoyance being in every case influenced by his surroundings—the temperature of the air, the currents of air, the quantity of moisture, and the modes of heating the apartments and the storage of the articles in use, all being in turn sources of the specks and spots so often seen on photographic pictures.

Dr. Keyser, of Nuremberg, has recently reported to the Munich Industrial Museum his experiments on heating the air in ordinary dwellings; and he found the products of the dust, when tested and drawn through absolute alcohol, to yield a yellowish-brown colour, black carbonaceous flocks, and when evaporated a brown residue, insoluble in water, intensely acid, and having a disagreeable, empyreumatic odour. Carbonic oxide invariably formed after heating, while the quantities of carbonic acid and water before and after experimenting showed no differences worth naming.

Many years ago Maculloch, Brande, and Faraday made numerous observations on the deposits upon the windows of houses—sometimes drops resembling oil, sometimes in a state of deliquescence or of crystallisation, according to the heat of the rooms. Nitrate of ammonia was thus made out; sulph*i*te of ammonia was found to have changed into sulph*a*te of ammonia, due to the combustion of coal in cities. Dalton showed, too, that during a storm the windows of houses in Manchester were covered with saline matters, common salt being thus readily proved to have travelled some forty or fifty miles from the sea. Dr. Angus Smith made many observations on the effect of manufactures upon local atmospheres.

Mr. G. Watmough Webster, in The British Journal of Photography for January 5 (page 4), gave a vivid account of the effects, last Christmas, of leaving his studio from the Saturday before Christmas Day to the following Thursday without the usual warmth; everything was "dank and miserable, sticky and wet," actually small pools of water from the sides of cameras, "and collected close to their bases." Of course, never more is the place to be left to ruin from the want of artificial warmth. Mr. Webster's paper is entitled *On some Recent Atmospheric Peculiarities, and their Bearing on the Storage of Negatives.* He says that his "plan is to place them in grooved racks open to the air back and front; and to keep spiders, &c., away thick open canvas is stretched on the wall side of the rack, the front being left *quite open* to the air, and having no covering of any kind. After the lapse of (say) three years they are removed and packed in bulk." He concludes:—"So far I have not lost a single negative from damp, and I see no reason for believing I ever shall." Now here we find a confirmation of Professor Tyndall's views. The currents of air prevent the deposition of matters containing germs of all kinds; and it is probable that such acute observations and refined experiments may tend to give confidence and comfort in the practice of photography. Thos. J. Pearsall, F.C.S.

GERMAN CORRESPONDENCE.

[Philadelphia Photographer.]

Centennial Awards.—The Paris World's Exhibition.—Causes of Stagnation in Business.—Unclean Bristols.—M. Carey Lea's Objections.—Lead Strengthening, and Eder and Tóth.

I read in your worthy journal of "much disappointment over the centennial medals for photography," and I can sympathise, as I am myself disappointed in the highest degree, and cannot well be otherwise when I notice that the centennial commission has erased from the American names alone, which by the jury had been proposed for awards, about eighteen, and among them such men as Gutekunst, of Philadelphia, and Landy, of Cincinnati, whose works have met with general acknowledgment. I have protested against this injustice at the centennial commission, and wish that the protest may have its effect. I have no part in this marking out of worthy names, and take no responsibility for it.

The American exhibition is hardly closed, and preparations are being made for the Parisian. Here, also, they begin to think about it, but at the same time there was, by some, opposition made in a most energetic manner to the Paris exhibition, and with good reason. World exhibitions only have their purpose when they occur at long intervals. Three years ago the exhibition at Vienna, this year at Philadelphia, and in two years another at Paris; this is too much. In two years, during this dull business time, our industry cannot make so much progress as to show something really new and instructive. We shall see the same that we have seen at Philadelphia; therefore the whole entertainment is not international, but only one of French interest. The city of Paris will be benefited at the expense of the exhibitors, who will spend thousands of dollars to live at Paris in the most effective style. It is time to protest against the topsy-turvy of world exhibitions. All nations, of course, have accepted the invitation to this exhibition. I asked some Englishmen their opinion; they said:—"The exhibition is very inconvenient for us, but we have to take part on account of business interest. The Frenchmen need only blow the horn, and all nations will come." But this time the German will stay at home; and that is right. They will say that Germany is afraid; that is nonsense. To those who have seen the grand American exhibition in chemicals, the little cases with German chemicals on the other side of the transepts seemed to be very diminutive; but when we opened them and examined their contents we found excellent articles, and, indeed, among eighty-six German exhibitors in chemcials there were eighty who received medals.

It is unnecessary now to remark that German photography is not bad. In short, I have not the slighest reason in my branch to be afraid of any world exhibition; but I am opposed to this one on account of the foregoing reasons, and I shall be glad if our nation does not dance as the Frenchmen pipe. After all it is not so very improbable that the European war, seemingly in progress, may in the last moment spoil the whole exhibition. Though the war is only as yet approaching, the dulness of business here is already very great. The *ateliers* are empty, and some are closed entirely. From all sides we hear complaints. But I must say that I found the decrease in trade, in a great many respects, far worse. Dr. Weissenborn, an eminent member of our society, finds the cause of this stagnation to be—that the public are surfeited with photographs. The public is tired of the *carte-de-visite* and cabinet photographs, and he believes that we ought to try something new in order to bring the business up again. He proposes, as a new idea, transparencies in carbon. They can be produced easily, look handsome, and bring money. Besides that, he recommends the production of more portrait stereos. The propositions have something in their favour, and perhaps not only for Germany, but also for America, where there is now, at last, more attention paid to the carbon process. Nevertheless, we ought not to overlook the fact that the cause of this quietness in business is not only the surfeit of the public with photographs, but the present general business calamity over the whole world.

Lately we have again heard many complaints about Bristols, which turned the pictures yellow after they had been pasted on. They had to throw away many thousands of such Bristols—a considerable loss for the photographers. In many cases which I had occasion to investigate the cause of this fault was a surplus of hypo. It is often used to take out of the bleached mass of paper the last particle of chlor, and thereby a little surplus remains in it, which turns into the picture and spoils it. One and a-half grain of hypo. in one sheet of picture surface is sufficient to cause the picture to be spoiled. This fault could be prevented if the manufacturers, instead of hypo., would take sulphate of natron (after the old formula $NaOSO_2$, after the modern formula Na_2SO_3; *natrium sulphurosum* of pharmacy). An extra quantity of this salt does not hurt. I have already kept for eight weeks some pictures which I moistened with a solution of *natrium sulphurosum,* and they show no sign of changing.

Professors Birnbaum and Wartha have recently investigated some soiled cartons. Wartha has found *no* hypo. in them; but he ascertained that the carton has been pasted on with sour starch paste which had been in a strong state of decomposition. Such starch paste contains acid of milk, which can have a very bad effect on pictures, as we know that acid more or less affects the tone of photographic pictures. Birnbaum, however, found in the same carton reducing organic substances which discoloured iodide of starch, and reduced the solution of silver. He declares grape-sugar to be the cause, and remarks that the same on damp pictures easily produces the formation of fungus, which also spoils the pictures. "We see, under the microscope, in the yellow spots which arise on the picture always little dark points, around which the destruction in a circular line is increasing." These points Professor Birnbaum declares to be fungi.

But there may still be other causes. Often they print a margin of gold bronze on the cartons, and not unfrequently the bronze contains sulphuret of tin. When the dust of it happens to come on the picture, and is rolled tight on it by the satinising machine, then on such places there will also arise yellow spots. Should any Bristol appear doubtful it would be best to cut it in pieces and soak it in distilled water. When this, after twelve hours, discolours iodide starch, then we should not trust the carton; but, finally, we can use the same after putting it in iodide water:—

Iodide of calcium	1 part.
Iodine	2 parts.
Water	2000 ,,

This destroys the hypo. contained therein entirely, and may, perhaps, oxidise the reducing organic substance also. I have pasted on unclean cartons, treated with iodide water, pictures which remained in an excellent condition. Such cartons, of course, colour blue in iodide water under the formation of iodide starch; but this blue colour disappears in a short time on being exposed to the air. We may paste pictures on the blue cartons without any damage.

Another offensive uncleanness of the cartons is ultramarine. They add it sometimes in order to make yellow cartons look whiter. This substance decomposes very easily with acids under the action of sulphur. Anyhow, this important point deserves further investigation.

As I have seen in several journals that Mr. Carey Lea has again made objections to my theory of colours, I regret I cannot discuss the matter. Since Mr. Lea's attacks have credited friend Waterhouse with assertions which he never made, or giving his decisions an entirely wrong meaning, I have considered it necessary to adopt the tactics of silence. In the meantime my friend Waterhouse has already published his remarks on this point, and shown that he agrees with my opinions, after which I may consider the matter as ended.

I informed you previously about the lead strengthening of Eder and Tóth. We dip the fixed and very well-washed negative, after rinsing it in distilled water, in a solution of six parts of red prussiate of potash and four parts of nitrate of lead in one hundred parts of water, wash it very well with distilled water, pour over it sulphide of ammonium, and rinse it with water. This method is not for portrait photography, but for the reproduction of designs. For this the results are excellent, especially for photolithographic purposes, as it gives a denser depost than we find in any other process. Lately Eder and Tòth spoke in a detailed manner of all objections made against their methods. It was said that their process produced dim negatives, but this is only possible when the negatives originally were dim, or when, after its adjustment, the hypo. has not been washed out sufficiently.

Further complaints were made about the voluntary cracking of the lead-strengthened negatives during drying. This occurs, however, only with some collodions, and can be prevented by albumenising the plates. Eder and Tóth recommend in such cases, also, to let the plates with the solution of lead become entirely dry before using the same. The strengthening then requires a longer time, but the negatives do not crack.

When negatives after the treatment in lead bath and washing show dimness, we can remove the same by applying a weak solution of hypo.—1 to 20.

The negatives strengthened with lead show, after drying, a very strong relief, of which we can take a galvanic plate. It ought to be remarked that the plates in the lead bath turn *white* under the formation of ferrocyan. lead and ferrocyan. silver. Instead of sulphur ammonium, they may also be strengthened with neutral chromate of potash, and we secure by this method negatives which are sufficiently dense, but not so much so as those strengthened with sulphide of ammonium.

H. Vogel.

Meetings of Societies.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The usual monthly meeting of this Association was held on Thursday evening, the 25th ult., at the Free Library, William Brown-street,—Mr. W. Atkins, the retiring President, in the chair.

The minutes of the annual meeting were read and confirmed.

Mr. G. J. J. Wells was elected a member of the Association.

Votes of thanks were then passed to the retiring officers of the past year.

The Rev. H. J. Palmer, the new President, then read the following address:—Among the first and pleasantest duties which naturally appertain to a newly-elected President is that of conveying to the Association his grateful sense of the honour done to him in his elevation to so important a post. With this expression of my cordial thanks I therefore inaugurate my year of office; and, while tendering to the members of our Association my hearty acknowledgments for placing me in this chair, I am not one whit behind any of my predecessors, on the one hand, in the sense of my unworthiness of the honour of filling it; and, on the other, in my determination to do all in my power both to further the interests and welfare of our Association, and to take my own due share in the promotion and development of photographic science. But, now, at the outset, I am oppressed with the conviction that a mistake has been made in allowing the well-worn mantle of many a versatile and (may I not say?) photographically-illustrious President to fall upon the shoulders of an individual who is the possessor of but one photographic idea, viz., that conveyed to the mind of the photographer by the word "gelatine." It would have been but fitting, for instance, in this place and on this occasion that I should have something to say of interest and possible novelty in relation to that great process which must ever be connected in the minds of future photographic generations with the Liverpool Amateur Photographic Association; but, unfortunately, collodio-bromide has received at my hands such scant attention, and, moreover, whenever I have paid court to it, has behaved so uniformly ill to me in its effect both upon my health in the ether-fumes, and upon my spirits as a result of innumerable failures and hopes disappointed, that I can but pass it by in solemn and expressive silence. A recital of my many disasters and failures (always excepting when I have used it in a commercial form), might afford some of the veteran devotees of this time-honoured process whom I see around me a passing smile of pity or possible contempt; but I am conscious that confessions of this kind would be somewhat humiliating in the mouth of your President. Nor shall I attempt to inflict upon you a review of the results of the past year's work, since this has already been done effectively and repeatedly. I should like, however, to say a few words on the subject of the experiments which I have been making lately in search of a substitute for glass as a support for the sensitive film. All who, like myself, are addicted annually or biennially to attacks of a mania for photographic vagabondising would, I am sure, hail with delight the discovery of a getatable substitute for glass, which should combine lightness and transparency with strength and reliability. My summer holiday is usually spent in Switzerland, and often have I groaned myself, or seen others groan in my stead, at the weight of glass to be carried over the alpine passes; and much have I longed for a discovery which should enable us to be no longer at the mercy of those porters, who make a point of dropping a case of valuable glass negatives on every available opportunity, and to set at defiance the inquisitiveness of *douaniers,* who are apt, in spite of polite assurance and earnest entreaty, to scent the contraband in a packet of sensitive plates. Mr. Warnerke's tissue is unquestionably the best and most valuable invention in the direction of our great desideratum. It is, however, essential that the substance we are in quest of should be readily obtained or easily made, and, of course, available for each one's favourite process. I have been lately experimenting with talc, *papier minerale*, and gelatine. Of these the simplest and best, in some respects, is talc. The gelatine emulsion flows readily upon it, it has the requisite stability for use in the dark slide, and the developing and fixing operations can be carried out with every comfort and success. I cannot report of its adaptability to collodion films; but the chief bars to its general use are the small size of the sheets and their costliness. I suspect, too, that it would be apt to split in the printing-frame. *Papier minerale* I find to be excellently adapted to the gelatine process. My *modus operandi* is as follows:—A preliminary coating of a thin solution of plain gelatine is applied so as to fill the pores of the paper and prevent the emulsion from permeating it. The paper is then wetted thoroughly and applied to a glass plate, all air-bubbles being carefully excluded, and perfect contact between the two surfaces secured. It may now be coated with gelatine emulsion, with as much ease as plate glass with collodion. By the time the film is set the paper will have parted from the glass, and the latter is ready for use with another film. It is better to leave a slight margin of paper to be folded over the edge of a glass plate, so as to strain the surface "taut" during exposure. Before development the underside of the paper should be again wetted, and once more pressed into contact with a glass plate. The usual operations can now be completed with the greatest facility. This support may, of course, be used with films of any size, and I think all who have conquered the difficulties of the gelatine process, and are desirous of obtaining good negatives of large size during the coming season, should act upon the suggestions I here give, and bring this method to yet greater perfection. I now pass on to the gelatine supports. The specimens which I hand round were cut from a sheet I purchased at a stationer's in this town. They are, as you see, of sufficient firmness and stability to carry the film, and, at the same time, are so light that three dozen of them will about equal the weight of one glass plate of the same size and of average thickness. I am bound to confess, however, that they are somewhat difficult to manage as supports for the gelatine film. They take collodion readily enough, and I have coated one of the films with an old collodio-bromide emulsion; but I suspect that the great expansion which takes place during development would cause the film to split, and prevent their employment with any other emulsion than gelatine. My method of using them with the gelatino-bromide process is as follows:—I fasten the sheet of gelatine to a glass plate, either with strips of adhesive paper on the margins of the sheet, folded down upon the under side of the glass; or I coat the glass with plain gelatine (twenty grains to the ounce), and when this is set, press the gelatine sheet into close contact with the surface of the plate. The former plan involves a little difficulty in coating with emulsion. The fluid is poured in a stream along the right-hand margin, and is rapidly swept over the surface before the glass rod. Then a plentiful supply of emulsion is flooded over the plate and the surplus returned to the vessel. But now comes the difficulty. The warmth and moisture combined will have raised crumpled elevations upon the film, and it requires no little dexterity to rock the plate to and fro so as to equalise the deposit of emulsion until the gelatine has set. I have, however, succeeded fairly well in my first attempt, and I found that the unevenness disappeared during the process of desiccation in the drying closet. The second method is far the simpler. The coating with emulsion can be effected with the greatest ease; but after passing a knife between the sheet and the glass, the former having reached the necessary stage of dryness, it will be found somewhat difficult to avoid stretching the gelatine in removing it from its support. I believe, however, that all these hindrances will disappear with practice. There is a stage in the desiccation of these films at which tackiness of surface has ceased, and a soft, leathery dryness has supervened, before the gelatine assumes its permanent dry form. It is at this stage that the film must be removed from the glass by passing a knife under it, and using a gently-persuasive force. It must now be submitted to pressure, and the result will be an even sensitive sheet, which may be placed in the frame, backed up with a plate of glass. The great advantage (apart from their lightness) of the use of these supports for gelatine emulsion lies in the fact that a homogeneous mass results, and that, therefore, blistering is out of the question. To develope successfully, the gelatine sheet should be immersed in a dish of water, and floated some time until thorough and even expansion has taken place; it should then be laid upon a sheet of glass somewhat larger than the film, and developed and fixed in the usual manner. I hope I have succeeded in making clear to you the *rationale* and method of procedure in the use of gelatine sheets in this way. I am quite sure that, if other workers will experimentalise in this direction, and if manufacturers of gelatine will aid us by supplying us with good, clear, insoluble sheets, the whole process may be considerably simplified and brought to the greatest perfection. I cannot leave the subject of gelatine emulsion without adverting to the two most valuable discoveries of the past year in connection with this process, viz., the beer organifier, and, for those who are afraid to make use of this, Lieutenant Lysaght's new method of development. At a time when all Liverpool has been stirred by eloquent utterances condemnatory of the use and abuse of beer, I may possibly run the risk of being misunderstood if I dwell upon some of its excellences. I will content myself, therefore, with the assertion that with the aid of these two discoveries the great difficulties of the gelatine process—feebleness and blisters—have disappeared. I fear that I have been the cause of the disfavour with which the beer organifier has been met of late, by calling attention to fungoid nuisances which resulted from its use. It is only fair, however, to state that if simple precautions be adopted to secure gelatino-beer plates from damp there will be nothing to interfere with their keeping qualities and general excellence. The use of bromide of ammonium in the emulsion in the place of bromide of potassium renders the employment of beer less necessary, density being readily obtainable without it. The bromide of ammonium, however, although giving great vigour to the negative, has the slight failing of causing brownish stains over the negative. I have not discovered any attendant disadvantage of this peculiar tint; but I believe I have found a remedy for it in the substitution of carbonate of soda for ammonia in the developer. My experiments are not sufficiently matured to enable me to give the best formula, but I hope to do so shortly. May I be allowed, in conclusion, to express a hope that the present year will be productive of even greater effort than hitherto among us in the practice and study of our art-science, and that our consequent progress may be evidenced to ourselves and to the photographic world at large by a more frequent production of papers at our meetings. I am sure that most of us look forward to our monthly reunions with a large amount of pleasure; but I am equally sure that that pleasure would be considerably enhanced were the reading of a paper on some subject of interest to us all an event of less rare occurrence than has latterly been the case. There is one more point in which, I think, we fall behind other societies to some extent, and in which, as age creeps upon us in our corporate capacity, we seem to become somewhat more lukewarm than we ought to be. I mean that which used to be one of the most enjoyable adjuncts of our Association—the monthly excursion. And now allow me to bring my remarks to a close by wishing the Association collectively, and every member of it individually, a prosperous and progressive year, both in photographic results and in all other respects.

The address was followed by some discussion on the best methods of obtaining a support for the gelatine emulsion, but nothing definite was arrived at. The expansion of the gelatine under development was considered a difficulty to be surmounted only by experiment.

Mr. Ellerbeck thought that Mr. Woodbury's plan of transferring the films on to paper might do, as it was certainly possible with collodion emulsion films.

Mr. W. H. Kirkby showed some of the Liverpool rapid emulsion negatives, stating that they were exceedingly rapid—more so than a wet plate. He (Mr. Kirkby) also detailed several experiments to avoid reticulation in carbon printing, but though he had tried the methods advised latterly in the journals reticulation still occurred.

Mr. Ellerbeck said that the same difficulty had happened to him, but by using a weaker solution of bichromate, and brushing over the surface of the tissue with a camel's-hair brush under water, reticulation disappeared. He (Mr. Ellerbeck) also said that his remarks at a former meeting about toning transparencies with chloride of palladium had been noticed by some of the foreign societies. He had stated that the price in this country, being so much higher than chloride of gold, would, no doubt, be a drawback to its use. These remarks had drawn forth a correspondence with a French firm, stating that they were prepared to supply chloride of palladium at one franc fifty centimes per gramme (about fifteen pence per fifteen grains), and no doubt it would come into use at this price.

Mr. T. Clarke exhibited one of Hare's changing-box cameras, with some negatives taken with it during the past season. Mr. Clarke also showed the way of working, and stated that he was much pleased with it.

The Chairman exhibited one of Werge's copying apparatus for attachment to a camera, and a hot-water apparatus for heating water quickly. These were examined with much interest.

Mr. Wilson, in moving a vote of thanks to the President for his address, hoped that the members would not be remiss in working at novelties and reading papers during the present year.

The meeting was shortly afterwards adjourned until the last Thursday in February.

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WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.

The ordinary meeting of the above Society was held at the Commercial Hotel, Bradford, on Monday, the 8th ult.,—Mr. John Smith, the President, occupying the chair.

The minutes of the previous meeting having been read and confirmed, Mr. John Lightfoot was elected a member.

Mr. Braybrook then read a paper on *Carbon Printing*. [See page 53.]

The President remarked that it was not the first time the Society had devoted an evening to the subject of carbon printing, as Mr. Greaves had on a previous occasion given a practical demonstration of the process. The subject was an interesting and important one, and he was anxious that all the members should, as far as possible, take part in the discussion.

Mr. E. Wormald (Leeds) said that he had not had a large experience in carbon printing, but from the results he had obtained it was not his intention to issue any more of his larger pictures in silver, as he could get a superior result in carbon, as well as ensure their permanence. He then handed round a number of prints in carbon 26 × 21 with matt surface, which were of fine quality and much admired.

Mr. W. **Smith** thought the length of time allowed for drying the prints in the final transfer was unnecessarily long. Providing the moisture could be got rid of he did not see that any particular time was necessray, and suggested that, instead of placing the whole of the print under pressure, it should be put in some sort of frame which would keep down the edges and allow the air to have free access to the back of the picture, thus facilitating the drying of it.

Mr. **Illingworth** was of opinion that slow drying was best, but thought that a good gloss could be obtained in a shorter time than had been stated to be necessary.

The experience of the members varying very much on the subject, it was agreed to put the matter to a practical test. Mr. Sachs, representing the slow drying, would submit prints dried in forty-eight hours, and Mr. Illingworth prints dried in the shortest practicable time, and the members would then be able to form their own opinion.

Regarding the question of drying tissue,

Mr. **Howarth** asked if a current of pure air was necessary, or could gas be used to obtain the dry air requisite.

Mr. **Sachs** said gas was very objectionable, and should not be used.

Mr. **Wormald** stated that all his tissue was dried by the air of a Bunsen gas burner, and he had found no harm to result.

Mr. W. **Cooke** was of opinion that dry air, pure, was much better than using gas, and mentioned that he had adopted a method which might be new to some of the members—that of pinning the tissue with its back round a roller of plaster of Paris, which rapidly absorbed the moisture and allowed the tissue to dry very quickly; and he suggested the use of thin plates of plaster for placing between pictures when mounted for full gloss, for the purpose of absorbing the moisture from the mounting-boards.

After some further conversation a vote of thanks was passed to Mr. Braybrook for his paper, and the proceedings terminated.

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THE PHOTOGRAPHIC SECTION OF THE AMERICAN INSTITUTE.

At the November meeting of this Society Mr. H. J. Newton, President, occupied the chair.

The **Secretary** said that the last number of The British Journal of Photography contained an article on a *New Carbon Tissue,* to which he desired to call the attention of the Section.

Mr. C. D. **Chapman** said that Mr. H. T. Anthony showed him, during the week, some prints which he had recently made, and that there seemed to be some peculiarities about the colour of the negative, which appeared to give a better tone to the paper prints than negatives of any other colour. He asked him if he did not think a peculiar opacity of lights and shades in the film would not produce the same effect. Two negatives with the same opacity will give quite different prints; one set will tone easier and much better than the other. This is due to the colour of the negatives. Now the question comes up, whether the colour of the negative affects the wave lengths of light on the paper; whether these going through a certain colour, changing the wave length, will not give a more pleasing tone than waves of another length. Thus sepia seemed to communicate a peculiarly-pleasing character to the picture. Now suppose we have a blue negative; all the light passing through that is blue light. Whether it is the wave length that does the work or the peculiar condition of the salts is a question. If we take paper and print it under red glass and then under ultramarine blue, the wave length of light in one case is nearly double the length of the other. Does this difference produce variation in the silver salt sufficiently to affect the tone of the picture?

The **Secretary** remarked that that was a pretty close calculation, and involved a problem most difficult to solve. The paper was under the negative only a short time; but under orange or red it was necessary to expose the paper a long time. A sensitive paper was subject to other influences besides the actinic light; and it was a very sharp point to demonstrate whether it was the length of exposure or the wave length which caused the variation. If it passed through a sepia negative the action was comparatively slower. Prints taken from the same negatives in sunlight and in shade often had a very different tone.

Mr. **Chapman** inquired whether it was the length of time or the wave length that did the work.

The **President** remarked that several years ago he experimented considerably with colouring negatives. He thought there could be no question but that different-coloured negatives made prints which would give different tones, other conditions being equal. He used aniline colours in the varnish to produce the different shades. A deep purple varnish was the one which gave the most pleasing results, and it was adopted at that time by quite a number of photographers.

The **Secretary** asked the President if he had ever given them a formula for the ground-glass substitute.

The **President** replied that there was one similar to his, published, he thought, in the *Boston Journal of Chemistry.* Some one saw it and put it in the market as a secret preparation. The ingredients were benzole and ether, with either gum sandarac or gum dammar. He usually used gum sandarac. He found that a little alcohol would make it work finer; with it they could grade it to any degree of fineness desired. The formula which he used was—

Ether	4 ounces.
Benzole	2 „
Alcohol	½ ounce.

The gum was added from ten to twenty-five grains to the ounce. Care should be taken not to use too much alcohol, which would give a transparent instead of a ground-glass effect. In using the preparation the result was the same as in printing by diffused light.

The **Secretary** asked if heat was used in applying the preparation.

The **President** replied in the negative; it dried in the air without artificial heat and very quickly. He had frequently, in preparing a negative where the sky was thin, used what was called in the trade "opaque" on the surface; and by rubbing off portions of that they could make clouds to suit their taste.

Mr. **Chapman** remarked that much was said of the durability of carbon prints. Now (said he) does not albumen prints last just as long as we want them? What is the use of having something that will not benefit the operator or his customers? I am pretty well satisfied that in the majority of cases it is found that as fashion changes new pictures will be taken. A change of fashion involves a change of dress; and people are anxious to see how they look in new costumes, and hence new pictures are desired. If all the pictures that Mr. Kurtz has taken of wealthy people were preserved, how seldom would he have to repeat them! The old negatives would not suit a new style of head gear. The carbon process may be valuable in showing the growth of a child, and in that case the first picture should be durable. Every photographer who does a general portrait business can usually judge whether a person wants a dress or a face taken. That class of people who care most for dress do not care for a carbon print. The majority of silver prints will last as long as needed. Historical and astronomical and such matters as require to be kept on record will give way to the carbon process; but as to its introduction into galleries, I do not think the photographer or the public want it. Those who desire to preserve their pictures are few.

Mr. A. **Beckers** wished some pictures to be copied by the carbon process, and he was told they would be more expensive.

The **President** said it was evident that carbon prints would be more expensive than silver ones. From a financial point of view the photographer did not look with favour on the carbon process; that, at least, was his inference. Whether, however, it would be for the pecuniary benefit of photographers in the long run to have it generally understood by their customers that the prints they furnished them would become worthless in a few months was a question which could be easily settled without discussion. He said he did not think it fully settled that silver prints could not be made as durable as carbon ones. The testimony of some, at least, in Europe who have given the carbon process considerable attention was that they were not always permanent. Gelatine, which formed the foundation of the carbon picture, bore no comparison to carbon for durability. If the gelatine should decompose, the picture of which it was a component would suffer. He said he had seen silver prints fifteen or twenty years old that had undergone no perceptible change; such prints were not, however, on albumen paper. More care was undoubtedly required to preserve the whites with albumen paper than with plain. Card mounts not unfrequently contained destructive elements.

Mr. **Weil** said that bronze was also the occasion of difficulty.

The **Secretary** remarked that he was convinced that atmospheric influences had much to do in producing this effect. Some eight or nine years ago a friend presented to him some one hundred and fifty or two hundred stereoscopic prints. He left them in his library down town, wrapped in the brown paper in which they came; they were not in a particularly dry place. But last winter, having to make some changes in his room, he brought them up to his present residence and examined them, and they were as brilliant as on the day they were made. He was surprised to find them in such perfect condition. Some two or three weeks ago he had looked at them, and found that then, in less than a year, they were nearly ruined, while during eight years they were not in the least affected. In the room in which they were formerly kept were hung some steel saws, and they were completely rusted. He kept in the same drawer with them a print which was sent to him about nine years ago to illustrate a panoramic work. That was kept in a pasteboard case, and was not affected in the least.

The **President** said there were some kinds of atmospheres that photographers worked in very injurious to their work. He remembered some ten years ago that Mr. Hallett, in the Bowery, sent for him, as he was in trouble. He said that all his plates came out of the bath with markings in the line of the dip. A new bath would work the same; and he wanted to know if he (the President) could divine the cause. As soon as he entered the room and used his olfactory sense and optics he at once determined what the matter was. The room was a large one, and the gas was brought from the farthest end, its entire length, to the operating sink, and the gas was carried in a rubber tube. The rubber was vulcanised, and the sulphur of the rubber combined with the hydrogen of the gas. The air was full of it, and that came in contact with the surface of the bath and formed sulphuret of silver there, which made the markings. He advised him to take the rubber down and replace it with iron pipe, which he did, and no further trouble was found. In The British Journal of Photography of Sept. 1st was an article on *Removing Hyposulphite of Soda from Prints*, which he would ask the Secretary to read; after which the Section adjourned.

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BERLIN PHOTOGRAPHIC SOCIETY.

This Society met on the 15th December last,—Dr. Vogel, President, as usual occupied the chair.

The Chairman laid on the table an album containing an interesting collection of landscape photographs and photographs of gronps of plants taken by Dr. Falkenstein, member of the German expedition to Africa, during his sojourn on the Loango Coast.

Herr Tiator, of Strasburg, then showed a model of a tunnel-shaped glass house furnished with curtains which closed with a spring when the cord holding them was touched—probably in the same way as the ordinary carriage-blind.

In a recent communication to the Society on the causes of the present depression of trade and means of reviving it, Dr. Weissenborn recommended that photographers should push stereoscopic portraits.

Herr **Goltzsch** thought this proposal unwise, or, at anyrate, premature, unless some understood standard were adopted for the size of the prints, the distance apart they should be mounted, and the space between the eye pieces of the stereoscope. He (Herr Goltzsch) had been a collector of stereoscophic views for some ten years, but he had always been annoyed by the want of uniformity in these respects as shown by the pictures that compose his series, every photographer suiting his own taste in these matters.

The gentlemen who had received samples of Herr Herzog's collodion then "tabled" their report, in which the said collodion was unanimously pronounced excellent, flowing equally, working cleanly, and having considerable power, yet being occasionally somewhat hard, and not sufficiently deep in the shadows.

Herr **Roloff** got structral flows in his plates.

Herr **Halwas**, who had long used this collodion, alleviated the hardness by the addition of a little bromised collodion.

Herr **Quidde** had used it for reproductions and had not found it too hard for that purpose.

The Chairman showed a negative, intensified according to the directions given by Herren Eder and Tóth, which astonished by its colour. It was the reproduction of a linear drawing, the lines of which were perfectly transparent, while the ground, which was perfectly white in the original, was chrome-yellow. The negative, therefore, appeared to the eye, especially when lighted by gas, very flat, yet it gave very powerful prints—a circumstance which should not be at all astonishing, seeing that chrome-yellow scarcely allows the passage of any actinic rays. The Chairman acknowledged the importance of this method of intensification for the reproduction of line engravings, but he thought it unsuited for pictures having half-tones, especially portraits.

With these remarks the meeting was brought to a close.

At a subsequent meeting, held on the 5th January, Dr. Vogel mentioned that some of the cases of the German exhibitors at Philadelphia had been injured by fire, and there was a short discussion as to who should bear the cost of replacing them. He further mentioned that the Society had obtained a medal for its collective exhibition at Philadelphia. This would be very gratifying were it not that a number of medals had been awarded by the commission without the recommendation of the jury.

A letter was then read from Herr Tiator, of Strasburg, with reference to a recent mention of his retouching powder, from which one would naturally suppose that it was pumice stone, which it was not. He enclosed several samples, which some of the members took home with them to experiment with.

The Chairman then made a statement having reference to M. Klary's system of lighting. He had read M. Klary's pamphlet, and found much in it good and worthy of attention, though nothing new. It recommends the use of a square screen held directly over the head of the sitter, so as to keep off direct top light, and diminish the hateful top light shadows and cast shadows.

Herr **Liebmann** said that he had received a circular from Herr Kleffel, in which a similar head-screen of lilac gauze was recommended.

Herr **Schaarwachter** remarked that Herr Ganz, of Brussels, had already used such an arrangeement of screens for years.

The **Chairman** then called attention to a newspaper paragraph, which stated that a method had at length been perfected by means of which photographic portraits could be reproduced telegraphically. This he could scarcely believe, as the reproduction of a photograph must present peculiar difficulties; but he did not see why a pen-and-ink etching, especially a profile, could not be reproduced by a process similar to that used for years for the reproduction by telegraph of writing.

Herr **Oldenburg**, a professional telegraphist, who had made many experiments in his day, described the process in so far as he knew it. The original writing is written with a non-conducting substance upon a substance which conducts electricity, and the latter is then developed about the cylinder. The latter revolves and moves slowly in the direction of its length. A conducting peg passes over and conducts the stream by the wire to another station, where there is another peg, which at the same time passes over another revolving cylinder, upon which chemically-soluble paper is stretched. This paper is coloured blue by the action of the electricity; if the stream is not broken at the first station by the non-conducting drawing, it remains white; and as the second cylinder moves like the first a series of white points is produced, which form a reproduction of the drawing or writing on the first station.

The meeting was shortly thereafter dissolved.

Correspondence.

CARBON TISSUE.

To the Editors.

Gentlemen,—At the last meeting of the Photographic Society of Great Britain Captain Abney advised students of carbon printing to prepare their own tissue—certainly for a time—so as to enable them to acquire a deeper insight into the working of the carbon process. Having taken this advice I write to apprise you of my success.

Having dissolved Nelson's gelatine in water, in the proportion of an ounce to a pint and a-half, I blended with it, very intimately, enough fluid china ink to give it a proper depth of colour, to which I added a little sugar to prevent over hardening when dry, and alizarin to impart warmth. I was about to use one of the aniline preparations for this purpose, but remembered in time that you had recommended alizarin (the colouring principle of madder) as a much more stable pigment. I next filled a flat tray with this compound, which was kept in a liquefied form by the tray being kept in a second vessel of warm water, and I coated my paper, in sheets, by slowly drawing it over the gelatinous compound and then suspending it up to dry. The paper I employed was an inexpensive kind used for cheap book printing.

The method of sensitising and printing employed differs in no respect from that adopted by every carbon printer; but in the subsequent treatment I made use of that modification of Fargier's process published six years ago in your Journal by Mr. J. A. Spencer, and which consists in coating a glass plate with collodion, rinsing this in water, and applying the pigmented side of the tissue to it by means of the squeegee, following this treatment by development.

I enclose prints that have been produced in the manner described, and I believe you will find that they are not inferior to such carbon prints as one commonly meets with. They possess a surface equal to that of the very finest albumenised paper, while the details are rendered quite as well as in the silver prints from the same negatives which accompany them for comparison.

I strongly echo Captain Abney's recommendation that those about to study carbon printing should, by way of experiment at anyrate, try the preparation of their own tissue. But to continue in this course after they have eventually found firm ground would probably be as unwise a policy as would be that of the preparation of albumenised paper, collodion, or other photographic stock which can be purchased so much more cheaply than they can be prepared by oneself.—I am, yours, &c.,

January 29, 1877. Alcestis.

[The prints enclosed are very fine, and reflect the highest credit on the ability displayed by our fair correspondent.—Eds.]

◆

WEIGHTS AND MEASURES.

To the Editors.

Gentlemen,—What is a "Winchester?" Some of your correspondents seem to take a special delight in that particular measure. Occasionally they are more definite, and name a "Winchester quart;" but it is sometimes left to our instinct to discover whether a pint, quart, or bushel is meant. I have taken the trouble to look through all the dictionaries, cyclopædias, arithmetical and other books of reference to which I have access, in quest of enlightenment, but in vain. I have some faint recollection of having heard of a Winchester something at school, but of course that sort of information has evaporated long since.

Something, however, I did learn in the course of my researches which may perhaps be of use to your readers; to wit:—

Teaspoonful	=	1 fluid drachm.
Dessert	=	2 fluid drachms.
Table	=	4 „
Wineglassful	=	2 fluid ounces.
Teacupful	=	5 „
Breakfast cupful	=	8 „
Tumblerful	=	8 „
Basinful	=	12 „
Thimbleful	=	¾ fluid drachm.
Pinch	=	1 drachm.
Handful	=	10 drachms.

This is from *Cooley's Cyclopedia*, which also mentions the old wine, beer, and dry-measure gallons; but I can discover no reference to a Winchester, a pailful, a small lump, a few drops, or several other measures often used by photographers.

Since writing this I have applied to the neighbouring chemist and druggist. He tells me that a Winchester is a large bottle. Bottle produced, inspected, and judged by both of us to be about two quarts, but assistant comes into council and *thinks* a Winchester is three pints.

In deep distress I wait the editorial or correspondential reply, as I am waiting to mix some solutions as per directions in your ALMANAC.—I am, yours, &c., R. S.

January 29, 1877.

[We hand this matter over to our correspondents.—EDS.]

EXCHANGE COLUMN.

Wanted to exchange, for a 12 × 10 landscape camera and doublet lens, a pair of well-made nineteen-inches globes on stands.—Address, R. H. TEAR, photographer, New Wimbledon, S.W.

ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

NOTICE.—Each correspondent is required to enclose his name and address although not necessarily for publication. Communications may, when thought desirable, appear under a *nom de plume* as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

QUEEN MAB.—There was at one time a photographic society in Macclesfield, but it ceased to exist many years since.

JOHN SLOAN.—Do you wish a formula for a ferrotype developer? We cannot make out from your letter the precise nature of your requirement.

AN OLD PHOTO.—The process to which you refer is quite impracticable; and the other "suggestions" emanating from the same source are worthless.

CHARLES WALDACK (Ghent).—The number missing has been forwarded. Your Journal is posted at the same time as heretofore. The delay in transmission or delivery arises in the post-office.

COLLODION (Glasgow).—As Messrs. E. and H. T. Anthony have no agent at present in this country the only course open for you to obtain their material for making collodion is by direct communication.

THOS. MACKINLAY (Prince Edward's Island).—A careful note has been made of your special requirement, and by the time this number reaches you it will have been dispatched by post, as requested.

J. H. M.—The fading seems so peculiar that we shall subject the pictures to a more careful examination before offering any opinion. Could hyposulphite of soda have had access to the paper previous to printing?

OLD PHOTO. (Rochdale).—Permanence is not to be looked for in the direction you indicate, as we have had several prints executed by that process which have faded more rapidly and to a greater extent than ordinary silver prints produced about the same time. We shall, however, consider the matter.

AULD REEKIE.—1. Professor Airey's statement had reference to the field of a single plano-convex lens; but lenses of this kind are never employed in photography.—2. Perfect flatness will not be obtained with the lens you describe, unless the diaphragm be removed about one and a-half inch further from the lens than it is at present.

C. V.—Our trials with the white enamelled metal plates have been in connection with their adaptation for the carbon process. When collodio-chloride is employed the prints fade with great rapidity—possibly owing to some action between the chemicals employed in this process and the material of which the enamelled surface of the plates is composed.

J. T. B.—1. It was at one time thought that a thin film of gelatine would prove more advantageous than either talc or collodion; but, after a protracted trial, collodion was finally adopted as being the best material for a substratum.—2. We know that the bichromatised gelatine will keep for several days, but are not aware of the precise duration of its keeping qualities.

E. L. MILES.—Possessing so much mechanical ingenuity you need not experience much difficulty in constructing a simple portable camera. Let the base-board be capable of extension; hinge to it the front and back frames for carrying respectively the lens and the dark slide; and let the body be formed of a thin, yet light-proof, fabric. The front and back frames must be kept rigid and in an erect form by means of struts. This is the simplest construction of camera we can suggest.

C. P. H.—We do not counsel the precipitation of the nitrate of silver from your bath, but would, instead, recommend the using of the bath to form the iodide of silver, and then removing the plate to a bath of plain water, afterwards pouring over the surface a little of a pure solution of nitrate of silver. By acting in this manner your plates will develope nice and clean. It is very unusual for photographers to employ baths of such large capacity as yours, even for plates exceeding three feet in dimensions.

F. W. BANNISTER (Manchester).—Writing on the subject of permanent silver prints our correspondent says:—"I have in my possession silver prints, both plain and albumenised, done twenty years ago upon the paper of Messrs. Pirie and Sons, Aberdeen, which are as fresh and vigorous as when first produced. I believe this permanency to be due to the paper being sized with animal matter, the mounting also having been done with similar material. The water-mark of this paper is objectionable, but this surely might easily be avoided."

G. S. HARDIE.—Our correspondent has sent an extract from the specification of a patent granted to Charles Cowper, about the beginning of 1858, for a method of preparing carbon tissue by means of gelatine, carbon, carmine, and other colouring matters, and inquires if this patent is now open to the world. In reply: while we have not access at present to Mr. Cowper's specification, there can be no doubt of its having expired long ago, as no patent is granted for more than fourteen years unless under quite exceptional circumstances, which could not apply in the case of this patent.

The Rev. R. SANDEMAN JONES writes:—"Can you inform me where the thin sheet rubber ($\frac{1}{38}$-inch) mentioned by Mr. Gough on page 103 of the ALMANAC for 1876 is to be obtained? I have tried one or two of the dealers in photographic apparatus, but they can only supply it in quantity made to order."——On making inquiry at some of the large retail rubber shops in London we have been shown, as the thinnest sample kept in stock, some which is by far too thick for the intended purpose. The kind required is made to order for chemists, some of whom may be able to supply it.

CHRISTOPH AËR.—1. The proportion of alcohol proposed to be added to the gelatine will defer the setting in of decomposition, but will be insufficient to prevent it finally.—2. We are not sufficiently acquainted with the antiseptic properties of borax to answer this query.—3. If you consult the table of symbols of compounds used in photography which is given at page 210 of our ALMANAC for the current year you will find that the nitrate of silver and iodide of potassium must be mixed in the proportion of 170 parts of the former and 166·1 of the latter. These yield 101·1 parts of nitrate of potassium and 235 parts of iodide of silver.

T. A.—We are unable to indicate any special features of difference in the four lenses numbered in your queries, beyond this—that the aperture of No. 2, being rather greater in proportion to the focus than any of the others, will work a *little* quicker when used with full aperture. Nos. 3 and 4 are so nearly alike (except in respect of name and mounting) that we cannot distinguish between the work of the two. The lens mentioned in the sixth query is said to give a flare spot in the centre of a landscape when used with a stop; but as we have never used this lens we cannot speak from experience. A "baby" lens will work much quicker than the portrait lens of smaller dimensions, unless a stop be used of such aperture as to bring it down to that of the smaller lens (proportionally speaking), when it will not possess any special advantage as respects rapidity. We are not at present aware of any maker of the plano-concave lens.

SIDEREAL PHOTOGRAPHY.—Mr. Huggins, F.R.S., made a very important communication to the Physical Society at its meeting on Saturday. For a long time he has been engaged with attempts to photograph the spectra of stars, and has obtained several partial successes. The chief difficulty to be overcome has been to follow the motion of the star with the telescope with sufficient accuracy, as a long exposure is requisite. This difficulty has been at last overcome, and there was shown on Saturday a clear photograph of the star α Lyræ. There is another interest attaching to this besides the fact that it is the first good photograph of the kind obtained. One of the calcium lines is wanting. Mr. Lockyer, some time ago, when experimenting on the dissociation of calcium, suggested that there were indications that the metal calcium as it exists on our planet is not an element. He pointed out that what was wanted was an examination of the calcium lines in the spectra of different stars, and for this their photographs were needed. Here was produced one such photograph as was wanted. Others will, no doubt, soon follow as atmospheric conditions permit. This first clearly strengthens the belief that calcium is not an element.—*The Times.*

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
February 5....	W. R. of Yorks. Photo. Soc. ..	Commercial Hotel, Bradford.
,, 7....	Edinburgh Photographic Society	5, St. Andrew-square.
,, 7....	Bristol Am. Photo. Asso.	Museum, Hueen's-road, Bristol.
,, 8....	Manchester Photographic Soc..	Memorial Hall, Albert-square.

METEOROLOGICAL REPORT,

For the Week ending January 31, 1877.

Observations taken at 406, Strand, by J. H. STEWARD, Optician.

THESE OBSERVATIONS ARE TAKEN AT 8 A.M.

Jan.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks.
25	29·82	SW	39	40	53	38	Raining
26	30·06	NW	35	37	44	35	Foggy
27	30·21	SW	37	39	49	32	Raining
29	30·17	W	35	37	51	35	Hazy
30	30·42	SW	45	48	49	36	Raining
31	30·09	WNW	36	38	—	35	Hazy

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 875. Vol. XXIV.—FEBRUARY 9, 1877.

BINOCULAR TRANSPARENCIES.

Seldom has a paper more replete with suggestive matter to the photographer been offered to a photographic society than that which was read on Thursday in last week at a meeting of the South London Photographic Society, and which will be found on another page in the current number of this Journal. The general theme of that paper is the interesting subject of *transparencies*, whether to be employed as stereoscopic pictures for the magic lantern, for window decorations, or in the production of enlargements.

There are two main ideas in Mr. Brooks's paper by which the attention of the emulsion experimentalist will not fail to be immediately arrested. These are, respectively, the variation produced in the tone by using, added to the developer, certain salts which modify the colour without increasing or decreasing the intensity of the image; and the prominence given to an important condition in enlarging, which consists in the production of a small negative free from granulation.

In the former of these is to be found the arena in which the Parisian manufacturer of transparencies will contend with his English compeers for the mastery. It appears to be generally recognised that the most attractive form in which a photograph can be presented to a connoisseur is in that of a stereoscopic transparency; and of all the pictures of this class those on albumen have had accorded to them the highest place, on account of their beauty of tone and the transparency in the shadows. As this beauty in the tone is purchased at the expense of permanence, it is obvious that if a rival process, capable of yielding equally attractive tones and having an equal degree of transparence in the shadows, were introduced it would possess at least equal chances of being employed for such artistic work; but when, superadded to these, we are enabled to record the permanence of the results obtained by the rival process then the triumph appears to be complete.

For a long period it has been known that the collodio-bromide process of photography was exceptionally well adapted for producing transparencies. Every gradation of light and shadow in the negative was faithfully rendered, the lights being pure and the shadows clear. Still, owing to the tone given by the alkaline developer, the transparencies thus produced have not found much favour; nor was this partial favour increased when gold, platinum, and other similar toning agents were employed to effect an improvement. It is at this juncture that the announcement made by Mr. Brooks that by the admixture with the developer of certain salts—such as acetate or phosphate of soda—a variety of tones can be obtained comes so very opportunely. We have at present on exhibition in our editorial office several examples showing the effect produced upon the tones of the picture by the judicious use of these salts; and those who are interested in this important branch of photography should call and examine them. Those in which the acetate of soda has been employed are of a warm brown tone bordering upon purple, and these, when compared with the choicest albumen productions of the Parisian artists, hold their own unmistakably.

The method of producing these transparencies is so simple, and the prospect thus afforded of utilising the large stores of binocular negatives in the possession of many photographers so good, that we join in strongly recommending it to professional photographers as a means of enabling them to introduce into their business something of a high class, and which cannot fail to be remunerative.

From an observation in the paper in question, we infer that it is not generally known that when binocular transparencies are produced by means of camera-printing it is not at all necessary that the negatives should be cut in two, and the respective halves transposed, before a proper transparency can be obtained. If the negative has been taken in a bi-lens camera, and if a copying (or printing) camera having only *one* lens be employed in the production of a transparency from such a negative, then the resulting transparency will be *pseudoscopic;* that is to say, the distant parts will appear as if in the foreground, while the objects close at hand, on the contrary, are thrown farthest away. If any one will examine in the stereoscope a binocular negative that has been taken in a twin-lens camera he will immediately discover the pseudoscopic effect to which we have just referred.

But in the printing of transparencies the remedy is exceedingly simple, and does not involve such an objectionable course as the cutting of the negative. This remedy consists in treating each half of the negative as a separate picture. This is effected by employing *two* lenses, instead of one, in the copying camera, and inserting a division in that portion of the camera extending from the lenses to the sensitive plate. The result secured by this is that each half of the picture is rotated, so to speak, on its centre in relation to the other half, and this condition is necessary in order to produce a stereoscopic transparency from a pseudoscopic negative by means of the camera. If a copying camera with only one lens be used the result will be that, while a transparency equally good in other respects will be secured, yet, as this reversion of each half in relation to its fellow will not have been obtained, the picture will be pseudoscopic. As we cannot call to mind that this point has been expatiated on before, we have now entered upon it with what we hope will not be considered an unnecessary degree of prolixity.

The second leading idea in the paper is that of the effect of the granularity of the image in the small negative upon the quality of the enlargement. The enlarged negative, and also a print from the original of that negative exhibited at the meeting to which we have referred, is now at our office, where it can be examined at leisure. Premising that the collodio-bromide image partakes to a large extent of the nature of a stain, in contradistinction to the large granules of which a wet collodion image is composed, it is easy to see what great advantages accrue from producing negatives intended for enlargement on bromised emulsion plates. The granular coarseness of the enlargement is of no consequence whatever; but the importance of both chemical and optical perfection in the small negative cannot be over-estimated, for this becomes the key to future success.

ON CERTAIN METHODS OF CORRECTING EMULSIONS.

There undoubtedly exists amongst photographers a strong predilection in favour of those methods of practice which deviate slightly from the beaten track, and if such methods hold out the further inducement of apparently saving trouble or decreasing the care necessary to success so much the better. Of this class we may reckon the various modes which have been recommended, from time to time, of correcting emulsions by the addition of certain foreign substances for the purpose of neutralising any excess which may be present of either of their constituents; the end aimed at in these cases is to secure a sort of automatic correction which leaves no loophole for bungling, and to reduce the chances of failure to a minimum. The object, no doubt, is a most laudable one, and when it is attained without the introduction of unnecessary complications, or worse, the process may be recommended; but we have no hesitation in saying that in nearly every instance an emulsion corrected in the regular and orthodox way, or so prepared as to require no correction, will be found to be vastly superior in working qualities to the best of those treated by any of the curative systems we refer to. How far some of these systems are successful it is our object to detail.

There are three distinct directions in which the "correction" may be exercised, namely, in the elimination of free silver, free bromide, and excess of water respectively. The first two are, in our opinion, best treated by conversion in the ordinary way into silver bromide; while the last, under proper conditions, has no right to exist at all. For the removal of excess of silver nitrate it has been recommended from time to time to add to the emulsion, after ripening for a sufficient length of time, certain substances insoluble in the emulsion, or at least supposed to be so, but capable of entering into combination with the free silver to form an insoluble compound which may be filtered out.

The charm of this system consists in the fact that it involves not the slightest trouble, care, or calculation. An indefinite quantity of the correcting substance is to be added and the rest left to the emulsion itself, the free silver in which will combine with what is necessary, leaving the remainder in an insoluble and, therefore, what is presumed to be an innocuous state, to be removed by filtration. In principle we have no fault to find with the mode of correction, as it renders automatic what is usually an operation requiring some little care and calculation as well as nicety in manipulation. But a careful trial of various substances it has been recommended to employ has convinced us that the principle as laid down above does not exist; that, in fact, the substances used are practically neither insoluble nor innocuous, and do not produce insoluble compounds.

We were induced to take up this matter some time ago by the perusal of a paper by Mr. Sigmund Singer, which we reprinted, and in which the author recommends the employment of cyanide of potassium, chloride of sodium, and carbonate of lime—all in the solid state. As we were dubious of the practical value of any of these substances when used for the purpose named, we took the earliest opportunity of putting them to the test, and the result of our investigations will now be given. Cyanide of potassium was the first tried; the emulsion employed was one containing five grains of free silver in each ounce and no *added* acid, though when tested with litmus-paper it showed a slightly acid reaction. The cyanide was broken into small lumps about the size of a pea, not powdered, nor was any powder allowed to get into the emulsion, and four or five of these lumps were added to four ounces of the emulsion. The immediate effect was simply *nil*, and for some time not the slightest trace of any change could be detected, though the bottle was well shaken at intervals to expedite the reaction. At the expiration of several hours, the bottle not having been touched in the interval, a slight brown deposit was noticeable, which upon shaking completely disappeared. The emulsion had become thinner, both as regards transparency and fluent power—most probably from solution or partial solution of a portion of the silver bromide, as well as from the action of the cyanide on the collodion; the effect increased as time elapsed until the maximum was reached in about a week, when the collodion had become so thin and the film given by it so transparent as to be entirely useless. The character of the film was such as might be expected from an old collodion which had been subjected to some decomposing action—such, for instance, as is produced by continued action of an alkali.

Now, as regards the working properties of the emulsion: in its original state, previous to the addition of the cyanide it was entirely unworkable, and fogged so badly under the action of the developer that no trace of an image was obtainable. As the effect of the cyanide became evident, however, the fog gradually cleared; but only to a sufficient extent, when the maximum was attained, to permit of the production of a thin, flat image incapable of intensification. Tested for silver, even three weeks after the first addition of the cyanide, it was found not to have disappeared, thus proving either that the cyanide does not remove it or that in its changed state it is redissolved in the emulsion. All the effects now described were obtained *in a much shorter time* by using a few drops of a saturated solution of cyanide in place of the solid salt, which makes it probable that the result is due to the solvent action of the water contained in the emulsion upon the cyanide, and that the latter in its undissolved state is inert. That it is dissolved is proved by the fact that if the emulsion be allowed to rest for several days, in order that any particle of the salt in suspension may subside, and the upper portion poured off, it will be found to smell strongly of cyanide.

We next come to the use of chloride of sodium, which is insoluble in absolute alcohol and in ether. We can say little of a special nature in connection with this, for its employment in the solid state is only a slower way of bringing about the same effect as if it were added in solution. It removes the free silver by converting it into chloride; but, *in the absence of acid*, is entirely without "rejuvenating" effect upon an emulsion which has reached the foggy stage, while if a restraining acid be employed the chloride may be dispensed with. It is difficult, therefore, to see in what the utility of this method of using the chloride consists.

Carbonate of lime behaves in a similar manner—gradually, but very slowly, removing free silver, but leaving the fog. It introduces an element of further trouble, however; for, setting aside the possible presence of particles of chalk in the emulsion, the carbonate of silver formed is itself not only unsuited to alkaline or, indeed, to any form of development, but is easily decomposed or dissolved, thus rendering the film extremely liable to pinholes, even were the results in other respects satisfactory.

The three substances above mentioned may be taken as representative ones, and from the preceding remarks, which are deduced from a large number of experiments, it will be seen that not much is to be gained by the adoption of such methods of treating emulsions.

To neutralise an emulsion containing free soluble bromide it has been proposed to make use of precipitated carbonate or oxide of silver, the bromides of some of the alkalies having a slight action upon those compounds of silver. The conversion of the free bromides by such means, however, is a matter of great uncertainty, unless a small quantity of nitric acid be used to first form silver nitrate; a very small quantity is sufficient to set up the action, which, though slow, will then progress regularly. But, unfortunately, the presence of unaltered oxide or carbonate of silver in the emulsion is as objectionable as, or more so, than free bromide, so that this method, too, falls to the ground.

The use of gelatine has recently been spoken of for the purpose of removing water from collodion. Theoretically it is well known that gelatine has a very powerful attraction for water, *so also has alcohol*; and practically it will be found that, with the very small proportion which water usually presents in collodion, gelatine is incapable of overcoming the affinity of the alcohol.

In conclusion: we think it will be found in this, as in other matters, that there is no "royal road" to success; and if the photographer be too careless to correct his emulsion in the proper and orthodox manner, he will be unlikely to gain any advantage from such makeshifts as we have mentioned, which would be better had they never held a place amongst photographic formulæ.

EDINBURGH PHOTOGRAPHIC EXHIBITION.

[Final Notice.]

Although the Exhibition was closed a fortnight since, and the exhibits are by this time nearly all again in the possession of those by whom they were contributed, the executive are still busy with the work of winding-up, and some time must elapse before affairs can be brought to a termination. From such information, however, as we possess, we think we are in a position to point to several lessons to be learnt and deductions to be drawn which may be gratifying at the present time and useful in the future.

Those—and we have reason to believe they were not a few—who have thought that the day of photographic exhibitions was on the wane must be pleased to find that, with well-directed zeal and energy, a collection of over three thousand exhibits can yet be made, and that the public interest is still sufficient to produce by admissions and sale of catalogues not only the five hundred pounds of expenses, but also leave a balance of something like two hundred pounds. Five hundred pounds may seem a large sum for expenses, especially when it is remembered that through the liberality of the Lords of Her Majesty's Treasury the use of the Royal Academy National Galleries was given gratuitiously; but the committee evidently had faith in the promise attached to the advice "cast thy bread upon the waters," and such confidence has been fully justified. Nor is it less gratifying to know that, important as has been the commercial success of the Exhibition, it would have been much greater had the Committee of Management not been compelled to close so soon in order to permit preparations to be made for the annual exhibition of the Royal Academy. From the very beginning the Exhibition continued day by day to increase in public favour; and on the last day but one there was a throng of private carriages in waiting, and an amount of over seventy pounds was taken at the entrance. That sum would at least represent fifteen hundred visitors, in addition to the large number of season and complimentary ticket holders.

We have more than once expressed an opinion on the propriety, or rather the impropriety, of giving medals or awards at photographic exhibitions, and, therefore, it is somewhat mortifying to learn, on the authority of those most intimately connected with the preliminary arrangements and the collecting of the pictures, that but for the fact that prizes were offered the Exhibition would have been very much poorer both in quantity and quality. We confess to having received this information with regret, but must, nevertheless, accept it as a fact, and be content to hope that the time will come when photographers generally will compete for fame rather than for tangible reward.

Although every facility was offered for the sale of pictures it is a little surprising that of the large number exhibited only about two hundred were sold. But this must not be attributed to any lack of appreciation or of buying power amongst our northern neighbours, but mainly to the fact that very few exhibitors had complied with the request contained in the circular to affix prices to the pictures; and it was no less disappointing to the would-be purchaser than to the exhibition superintendent that, in at least three cases out of every four, the answer to inquirers was "not for sale," or "no prices given."

We presume it is not in the nature of things that medals should be awarded to the satisfaction of all interested; but in the present case, from all we can learn, as near an approximation as possible to that state of the matter has been attained. The committee decided to appoint five judges—to include two artists, one architect, and two photographers—and were peculiarly fortunate in securing the President and an Associate of the Royal Scottish Academy, an architect of recognised ability and great reputation, and two of the oldest and best-known photographers in the country. Such a staff was not only above all suspicion, but commanded the respect of every exhibitor to such an extent that even the most disappointed—if disappointment there be—hardly dares to charge it with an error of judgment. Our correspondent, "Free Lance," says—"The committee of the Edinburgh Photographic Exhibition has put its foot on retouching;" but in this we think he is mistaken. The judges certainly mention the undoubtedly beautiful works of Gutekunst, Kozmata., &c., as being so modelled and retouched as to place them out of competition with comparatively untouched work; but with this the committee had absolutely nothing to do. The judges went to their work altogether untrammelled, and without one iota of instructions other than what were contained in the circulars issued to exhibitors.

Of such a large number of exhibits the limited space at our disposal would only permit us to notice a few of the works; and, although it is now probably too late to continue our criticisms, there are one or two items of an exceptional character that should not be omitted.

At an early period of the arrangements Mr. Charles Harrison, of Guildford, very handsomely offered the committee a selection from a collection of many thousands of photographs, the gathering of many years, and intended to illustrate nearly every branch of science and art, both ancient and modern, including the advancement of photography from its starting-point. In the expectation of being able to set apart one room for their exhibition the committee gladly accepted the offer so generously made to the extent of a thousand pictures; but when the time for hanging came they were reluctantly compelled to be satisfied with the exhibition of only a few hundreds. Those were arranged on two sides of the south room, comprising Nos. 918 to 920, and excited considerable interest, especially the examples of ancient architecture and statuary and the illustrations of ethnology. Such a collection as Mr. Harrison possesses must be almost a priceless treasure, and if those shown be fairly illustrative of the collection as a whole, it bears ample evidence of his rare ability for such "a labour of love."

Dr. George Keith showed a number of daguerreotypes taken in 1844—the first photography done in the Holy Land—together with electrotypes and engravings taken from them to illustrate a work—*The Fulfilment of Prophecy*—published shortly after the above period.

Mr. Panton exhibited an interesting series of negatives from which the well-known calotypes by Messrs. D. O. Hill and Adamson were printed, with prints from them. Notwithstanding all that has been said about the improvement of photography as an art, we question much if anything of the present day surpasses or even approaches them in breadth of effect and general artistic treatment.

Messrs. Ross and Pringle exhibited a complete set of daguerreotype apparatus, and some very fine specimens produced by that once-popular process. Some beautiful daguerreotypes were also shown by Mr. Mungo Burton, of Colinton. Nothing can better illustrate the rapidity with which a process may be forgotten than the fact that again and again inquiries were made by photographers—some of whom were even in the enjoyment of large professional practice—as to what the apparatus really was, and the interest in getting its working explained.

In now taking leave of the Exhibition we must say that the Edinburgh Photographic Society has reason to congratulate itself on a success much greater, we are convinced, than even the most sanguine member ventured to anticipate—a result all the more creditable because most, if not all, the executive were new to the work; and we venture to hope they will not be content to rest on their laurels, but simply regard their exceptional success as an incentive to still greater efforts when the period for the organisation of another exhibition shall have arrived.

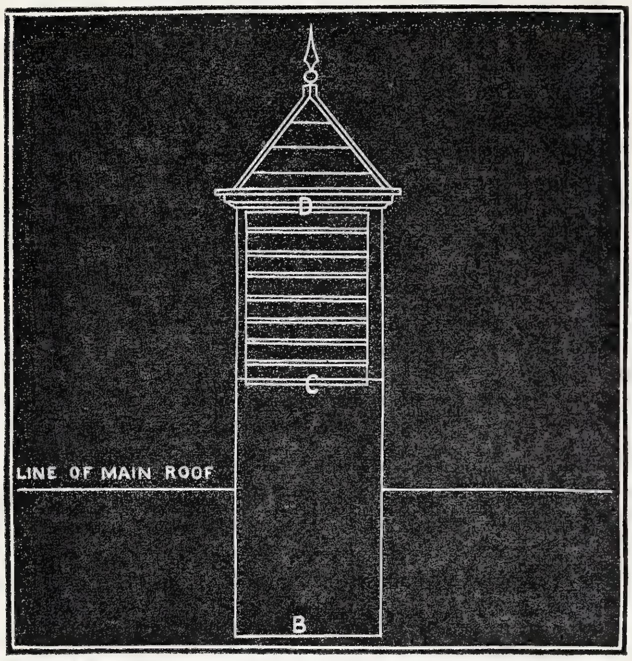
VENTILATION.

It is my good fortune to be acquainted with many photographers, professional and amateur, and, having observed lately that many of my friends have been suffering from ill health, being placed *hors de combat* through some cause or another, I have been led to reason from this effect to what I think is in many cases the cause—*bad ventilation.*

Mr. Jabez Hughes, in his excellent little work, says somewhere—"Ventilate your dark room." I believe that in many cases we totally disregard this injunction, or, if we do regard it, we neglect to carry it out. We seem to forget, when we are stopping up every nook and cranny to keep light out of our dark room, which in that place is our enemy, we are at the same time perfectly excluding our best friend—fresh air. We almost—I was going to say—hermetically seal ourselves in with—what? an atmosphere as bad, almost, as that of the Poison Valley of Java—an atmosphere laden with impurities of which the modern sanitary reformer never dreams; actually and metaphorically speaking such things never enter his head. It is much better for any one not to breathe such air, contaminated, as it is, with bromides, iodides, sulphides, cyanides, and a host of similar horribles too numerous to mention, which so vitiate the air as to render it totally unfit for breathing. Who has not felt, after a few hours' hard work in the dark room, a weariness, not unfrequently accompanied with headache and a want of appetite, which eventually, if the work be persisted in, will most certainly lay the operator aside? I believe want of fresh air is one of the chief causes of many of the ills the profession seems to be heir to.

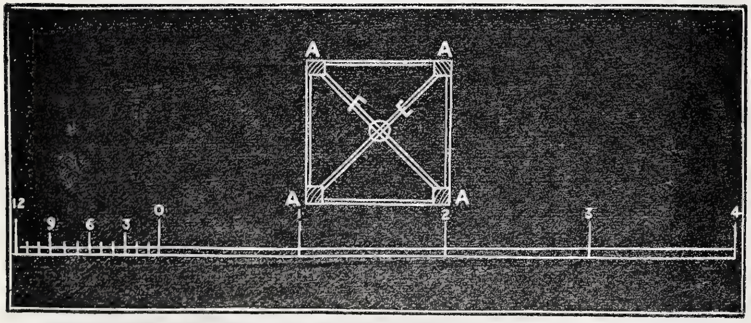
It has been justly said—"It is one thing to point out an evil, but another thing to apply a remedy." Having said so much on the former let me try to attend to the latter, which is the object of this short article. First, then, proper ventilation is compatible with perfect exclusion of light. Secondly: you can have the air of your dark room continually renewed without the danger resulting from draughts. I should say make the ventilation of your operating room and that of your dark room independent of each other. I, some time ago, had to endeavour to rid a large dyehouse of steam arising from the boiling vessels. The plan adopted in that instance was effectual, and has also been found in more cases than one to answer the desired end—that is, the constant renewal of the air in the dark room; and, as a principle of ventilation, it is capable of universal application.

FIG. 1.



Figs. 1 and 2 are respectively the elevation and plan of the ventilator. A A A A are the four corner-posts, framed together and boarded from B to C with three-quarter-inch boards. From C to D is filled in with louvre boards, which let the air in or out with freedom. E and F are two diagonal "brattice boards" (to borrow a term from mining nomenclature). These brattices run up the whole length, and form angle rafters for the roof of the ventilator, which is looped on all sides. It will be seen from an inspection of the above diagram that from whatever direction the wind blows you must have a system of ventilation upcast and downcast. To render the work still more perfect air-bricks should be walled in at frequent intervals behind the skirting-boards, which should have corresponding openings adjustable at pleasure. J. Garbutt.

FIG. 2.



THE COLLODIO-BROMIDE EMULSION PROCESS APPLIED TO TRANSPARENCIES, AND ENLARGING WITHOUT A NITRATE BATH.

[A communication to the South London Photographic Society.]

Stereoscopic Transparencies.—It is to be regretted that stereoscopic pictures are in so little demand at the present time; I allude both to the ordinary paper slide and the transparency on glass. The latter, to my mind, if properly made, is one of the most beautiful productions of the photographic art. I attribute the falling-off in the demand for the ordinary paper slide (to be viewed by reflected light) to the enormous amount of trashy stuff the market has been glutted with—looking abominable out of the stereoscope, and much worse in it.

The great drawback to the glass transparency, I think, has been its price—the best ones being made by a very tedious process on a film of albumen, which is liable to fade. I do not think that at the present time a good slide can be obtained at less than five shillings; and such a price is far too high for persons of limited means to purchase. A moderate collection (say fifty slides) at the price mentioned would come to a good round sum—more than many could afford—and therefore they go without them altogether. The great cry of photographers at the present day is for something new that would create a demand; now this branch of the art is one that has been but little worked, and the little that it has been worked has been done in a very expensive way. I think the generality of photographers are very conservative, and will not do anything unless it can be done with the nitrate bath, &c.; for if one happens to mention anything about emulsion work, dry plates, and the like they begin to pull a long face and say they don't believe in it, and still go on in the old jog-trot sort of way.

I have tried the nitrate bath, iron development, and pyro. development for stereoscopic transparencies, and the results have always been cold and hard, with inky tones and very coarse. I can find nothing for their production like the emulsion process worked in the way I shall describe, showing you the results of my experiments. I am able to obtain all the warm tones exactly the same as we see in our well-toned silver prints—a nice, rich, warm, chocolate brown—rivalling those I before mentioned as produced on the albumen films; and they can be produced and retailed in the market at about two shillings and sixpence each, leaving a good margin for profit. If a good demand sprang up they could be reduced still lower in price, which, I am sure, would cause a revival of the stereoscope. At the present time there are thousands, and, I may say, tens of thousands, of stereoscopic negatives now idle, stowed away in the plate-boxes of the photographer, both amateur and professional. There are several methods by which they can be produced.

No. 1.—Printing by contact is all very well if only one or two be required; but for commercial purposes it does not answer, as the negative becomes damaged in spite of every care that is taken in dusting both negative and plate, although contact printing produces very fine results. At the same time, to produce the subject in its proper position two glass plates have to be used besides the one that carries the collodion film, which has to be cut and the halves transposed to bring them into their proper position (presuming the original negative has been taken with a binocular camera). In printing by contact the glass used must be perfectly flat and clean. In this case the plate must be albumenised with—

White of	1 egg.
Water	1 pint.

The plates can be either immersed in it or coated with it while still wet and set aside to dry. My reason for albumenising the plates is that in contact printing, if the film gets punctured with small holes, it will sometimes crease up during development and spoil the plate. After the plate is thoroughly dry it is coated with a *thin* collodio-bromide emulsion, known as "washed emulsion," and set aside to dry, film outwards. I may also mention that it requires a little knack in coating the plate to avoid crapy lines. A pool of emulsion is poured on one end of the plate, allowed to flow downwards in a wave, and poured off at one corner, when the plate is rocked one or twice—*not more;* then bring the plate into a vertical position, and by this means, if the emulsion be in good condition, all crapy lines will be avoided.

After the plate is dry it is placed in contact with the negative in an ordinary printing-frame, and exposed to the light from one to three or four seconds, according to the density of the negative and intensity of the light. Care must be taken in removing the plate from the negative that it does not grate, as the film is very tender. Methylated spirit is now poured over the film and returned to the bottle, as in the case of collodion, and allowed to soak in for a minute or two. I do not hold with the plan of diluting the spirit, for if diluted it does not do its intended work so readily, and the development is more difficult; the film requires to be restored to its pasty condition as much as possible. If a quantity are being done the best way is to use a dipping-bath with a cover.

On being removed the plate may either be washed under a tap or immersed in a dish of water till all the greasy lines are removed and the water flows freely over its surface. The plate is then placed in a little shallow glass tray similar to that described by me in The British Journal Photographic Almanac for 1876, page 115. I find it very handy, and the progress of development can be readily seen without any fear of its falling out when holding it up to the light to look through it; it can be turned bottom up, yet sticks as tightly as wax.

I prepare stock solutions, which keep well in stoppered bottles, thus:—

P.

Pyrogallic acid (English)	96 grains.
Absolute alcohol (sp. gr. 805°)	1 ounce.

B.

Bromide of potassium	15 grains.
Water	1 ounce.

A.

Liquor ammonia	40 minims.
Water	1 ounce.

After the plate has been sufficiently washed in a clean measure take five to ten drops of solution P, three drops of solution B, one drop of A, half an ounce of water, and pour this over the plate. If properly exposed the image will begin to appear in about half-a-minute. The above quantity of developer is for stereo. size. If the image appear too quickly add a drop or two more of solution B; if it come up slowly add another drop of A. When the developer apparently ceases to act add one or two drops at a time of each of solutions A and B, which will give intensity. This system of development is the ordinary method adopted, but gives to transparencies a rather smoky colour when viewed by transmitted light. I find that I am able to get very pleasing tones, similar to those we have in our well-toned silver prints. Instead of using plain water I use a solution of acetate of soda, which I keep as a stock solution—

Acetate of soda	4 drachms.
Water	1 pint.

This not only seems to impart a better tone to the picture, but it also appears to act as an accelerator. I also use a solution of phosphate of soda if I wish to have a sepia tone. The phosphate solution is used in place of the acetate of soda solution, and in the same manner:—

Phosphate of soda	2 drachms.
Water	1 pint.

I will now pass round for your inspection specimens developed by both methods, which will fully corroborate what I have just stated. I have no doubt that using other neutral salts will give a greater variety of tone. Should the tone appear a little too warm in colour I give a slight intensification with—

Pyrogallic acid	3 grains,
Citric acid	1½ grain,
Water	1 ounce,

with a drop or two of a ten-grain solution of nitrate of silver, as in the wet process.

I must not omit to add that the alkaline developer should be well washed off, and some dilute acetic acid flowed over the plate to neutralise all traces of ammonia to avoid stains. If black tones are required give a much shorter exposure, and develope by either of the before-mentioned methods, not carrying the alkaline developer too far, but bring it up to the required density with the acid pyro.

Fix in a solution of—

Hypo.	1½ ounce.
Water	1 pint.

Well wash, and varnish with a varnish made of white, hard varnish thinned down to the proper consistency with methylated spirit, adding about two drops of castor oil to prevent its splitting in time to come.

Instead of using ground glass—a good sample adding very much to the cost—I use an ordinary matt varnish diluted with ether, as it gives a much finer grain, and is very inexpensive, which must not be lost sight of. The slide is now ready for mounting.

No. 2.—Instead of printing by contact use a non-distorting lens, and make the transparency in the camera in the ordinary way, using the plate in the dry state, as in the preceding method. The transparency also requires cutting for transposing. The best system, however, is to cut the negative in half and transpose. By copying with the camera we also have the advantage of either reducing or enlarging the subject according to the amount of the subject to be included, and a mask put in the dark slide in front of the plate makes a much neater job. The development is the same as in printing by contact.

No. 3.—The plate is coated with emulsion; but, instead of letting it dry, put it in a dish of water until all greasiness has disappeared, and expose in the camera while still wet. No substratum must be used in this instance. By this method the tones are different, giving a greenish hue. When fixed, washed, and dried it is coated with a solution of india-rubber in benzole, and then with a thick collodion, alternately, several times, until a good thick film is obtained, similar to the Warnerke films. In the last coating of collodion I saturate it with white wax; this dispenses with the use of the ground glass or matt varnish. When perfectly dry the film will readily peel off; then it is cut and transposed, gummed at one edge of a cut mount, and bound between two pieces of glass. This system is more tedious than the former ones. I now pass round a slide made by this method.

Lantern Slides.—These can either be produced by contact, in the same way as the stereo. slides (and developed also in a similar manner), or they can be copied from the negative in the camera and enlarged or reduced at pleasure. At the last meeting of this Society, being the popular lantern evening, the whole of the slides I exhibited were made by this process. Most of you saw the kind of image they produced on the screen. Several members having wished to examine the slides themselves, I now take the opportunity of complying with their request. In making the slides it is better that they should be developed by the alkaline developer alone; and, as it is an important point to keep the lights of the picture bare glass, before fixing flood the plate with—

Acetic acid (Beaufoy's)	2 ounces.
Water	8 „

This appears to take up any deposit on the surface that may have taken place during the development. I have heard several complain that slides produced by this process looked cloudy. Varnish with diluted white hard spirit varnish, the same as mentioned in a former part of this paper.

Transparencies for Decorations.—These may be produced by the same process. I will leave you to judge of how far I have succeeded by the specimens I have brought with me. I find that frames can be purchased in brass with chains for suspending those for window decorations, which answer the purpose admirably.

Enlarging Without a Nitrate Bath.—If a negative be taken with the intention of producing an enlarged negative I prefer taking the original on one of the dry plates before mentioned, using only *alkaline* development. If acid pyro. and silver be used it causes a granular deposit. It is true the granules are small; but when enlarged up to several diameters they are very offensive, as we all know. If the negative is to be printed from, and not enlarged, I quite agree with Mr. Woodbury that it is best to intensify with pyro. and silver; the resulting print will have a true dry-plate effect. The effect of this pyro. and silver intensification is that it produces a very fine stipple which gives softness *but will not do for enlargement*, and I think this is why enlargements look coarse.

I prefer to make the transparency by contact and develope by the *alkaline* method only. The enlarged negative is made in the ordinary way from the transparency, instead of using a plate prepared in the bath. The plate is coated with an emulsion, and immersed in water until the water flows freely over its surface; it is then ready for exposure. I have prepared an enlargement by this method, using alkaline development, *followed by pyro. and silver*, to bring up the intensity. I have brought with me the transparency and enlarged negative, also some prints from the latter. You will find there is not any coarseness, although I have enlarged it up to three and a-half diameters, and I now submit it for your inspection.

William Brooks.

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NOTES ON PASSING EVENTS.[*]

By a Peripatetic Photographer.

The law is proverbially fickle. I perfectly well recollect how that on one occasion a gentleman saw exhibited in the show-case of a photographer a portrait of his wife, and that he sent upstairs a request that it should be removed instantly, which request not having been immediately complied with the gentleman broke the glass of the frame with his stick, removed and destroyed the portrait. Of course the photographer went in for "damages" to form the *quid pro quo* for the other kind of damage inflicted upon his property. The magistrate held that the photographer had no right to exhibit the lady's portrait without permission sought for and obtained; that at the husband's request he was bound to have had it instantly removed from the show-case; and, finally, that the gentleman was not to be blamed for acting in the manner he had done. This, when looked at from the common-sense point of view, appears to be a perfectly fair decision; but common sense and common law seem to be quite two distinct things. At the Leigh petty sessions a case was recently heard which is of a character happily not common in connection with the ranks of portraitists. A photographer there seems to have exhibited in his window the portrait of one of his clients, although, according to the defence, an express stipulation had been made that no such public exhibition should take place. On being twice requested to remove the photograph he refused to do so, upon which the gentleman broke the window of the photographer, removing and destroying the portrait. "Strange! passing strange!" The bench ordered the gentleman to pay for the damage, and also added costs! I may be wrong, but I have an idea that a different decision would have been given in London, always provided that the case, as it meets the public eye in a paragraph in The British Journal of Photography, has been reported with ordinary accuracy. I do hope, for the credit of photography, that the Leigh photographer will come forward with some further explanation than has yet been given.

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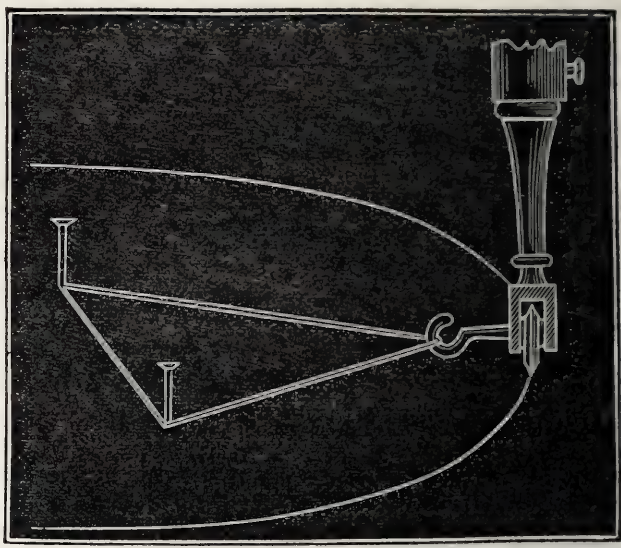
[*] Concluded from page 54.

Advertisements are now to be seen about some of the London railway stations notifying the desire of the advertiser to acquire business premises in a commanding situation and adapted for taking photographs at night, from which it is not difficult to deduce the inference that we are about to have a revival of something that a score of years ago was a source of great attraction for the proverbial nine days. Portraits of the "very highest" excellence were to be taken from dusk till midnight, and even after that if necessary. A boon was to be conferred upon the numerous classes that are so much occupied during the day as to be unable to obtain leave of absence for a single hour in the whole year during the diurnal period when the greater of our two celestial luminaries hold sway. Apprentice boys and others who could only get their faces washed and their Sunday clothes put on after the going down of the sun, and servant girls who could perhaps only steal away after missus had had her supper, were to be immortalised by the camera of the photographer, who proposed to render "beautiful for ever" those coming to him after dusk to present their forms to his camera. Shades of Moule and Co.! What quantities of pyrotechnic powder were ignited about the hours when ordinary mortals were having their supper or enjoying their first sleep! It was "no go," however; the public either could not or would not extend the patronage necessary to keep these night shops going, and they were all soon numbered among the things of the past. Neither the electric light nor the magnesium light could restore the public confidence in professional photography practised between "dewy eve" and the "witching time of night"—not even when aided by reflectors and condensers of the most approved description. Those who are now about to organise another nocturnal photographic establishment, or series of establishments, will, I hope, receive more encouragement from the public than their predecessors. There is no reason why photographs of excellent quality should not be taken by artificial light as well as by daylight. All that is required is to cause the light to fall upon the sitter in the same direction and angle as that by which he is illuminated in the studio by daylight, and to have the light of such a degree of intensity as to prevent a long exposure being necessary.

A query put by one of your correspondents (the Rev. A. Jenkin), relative to the practicability of adopting a quicker mode of printing during this dull weather than that usually employed, prompts me to make an observation on one of the suggestions offered by the Editors in reply. The method of camera-printing upon wet collodion, practised for some time in this country by M. Disderi, while seemingly objectionable in theory is, nevertheless, excellent in practice. Can any reader inform me why this should be the case? By means of a repeating camera twelve transparencies are taken from the portrait negative on one plate of glass. After development with iron they are fixed, washed, flushed with a solution of bichloride of mercury, and again washed. While still wet a sheet of very fine, "surfaced" paper is gently pressed in contact with the film, and, without waiting till it becomes dry, it is again removed from the glass, carrying with it the twelve pictures. When dry these are trimmed and mounted in the usual way. These prints possess a charming tone; and, notwithstanding their being toned with mercury, they appear to be quite as permanent as gold-toned, albumenised portraits. Why should this be so? But apart from the method of toning, which *is* objectionable, this process of producing prints with such rapidity ought to commend itself to those who have to supply a dozen *cartes* within an hour or two after the negative has been taken. That such a feat can be accomplished there is no doubt whatever; and the name and reputation of M. Disderi prove a sufficient guarantee as to the excellence of the results possible to be obtained.

A NEW USE FOR THE AMERICAN PHOTOGRAPH TRIMMER.

This little instrument has proved of great use to photographers for cutting clean, sharp ovals, especially for masks, which are so much used now, as the part cut away and the part from which it is cut coincide so exactly. I have a new use for it which I offer to your readers, who are, no doubt, mostly mechanical enough to make the new adaptation for themselves.



Most of them know the old and still best method of forming an oval with the aid of a piece of string and two pins. This method has lately been described fully in the journals. The only alteration necessary is the substitution of the piece shown in the diagram for that of the pin on which the wheel now revolves. This can easily be made out of a piece of iron wire bent into the form shown. The string or, better, thin, non-elastic wire is passed over the hook and two pins, and turned round as the pencil would be. In cutting ovals from cardboard it is essential that the first revolution shall make a groove of sufficient depth that the trimmer will follow it until the cardboard is cut through. I trust this little hint will supply a want long felt by photographers. W. B. Woodbury.

SCIENTIFIC JOTTINGS.

The vast and increasing importance of photography to astronomy is shown by the almost continued reference to its agency on all occasions when the votaries of the latter science meet. It seems to be able to give aid alike in the grandest of their conceptions and in the most rigorously exact of their mathematical calculations or measurements. What its exact usefulness in the latter way in the great transit of Venus observations may be is yet to be determined; for it is stated on good authority that the measurements of the photographs—those for instance, taken by the French parties—is not progressing favourably. More than one thousand plates are to be investigated micrographically, and at the present moment only forty-seven have been disposed of. Unforeseen difficulties are said to have arisen.

Our readers may remember having seen at the Loan Collection a number of very beautiful astronomical photographs executed at the observatory of Vilna, at which for twenty years past solar photography has been the chief work. We regret to learn that it is totally destroyed by fire, neither the great equatorial nor the photo-heliograph having been saved, though strenuous exertions were made, and unfortunately also the results of a large number of observations shared the general destruction.

The theory of the latter of these instruments formed the subject of a paper by Professor Harkness, read at the Astronomical Society on the 12th ult. The instrument consists of a heliostat and a long-focussed object glass, in the principal focus of which the negatives are taken. The distortion produced by secondary magnifiers is thus avoided, and very accurate means are adopted for determining the shrinkage of the collodion film upon the plate and the accurate orientation of the photograph.

At the Physical Society, on the 20th ult., great interest was caused by the exhibition, by Mr. Huggins, of a photograph, half-an-inch in length, of the spectrum of the star α Lyra, which he had recently taken in a manner similar to that in which the spectrum of Sirius had already been obtained. The exposure required is very long, and owing to the clockwork not being accurate enough to maintain the image of the star on the slit for a sufficient length of time, the earlier results were almost failures. But a secondary control apparatus, devised by Mr. Grubb, enabled him to produce the perfect example shown in place of the previous very unsatisfactory results. The photographic arrangement consisted of a prism of Iceland spar and lenses of quartz, dry plates being used. Dr. Huggins has also been engaged in taking photographs of the moon, which he hopes will give some aid towards settling the vexed question of the existence of an atmosphere of small extent in the moon.

Mr. Lockyer attached extreme importance to these results, and he pointed out how he hoped a large series of such photographs would afford valuable information in regard to the composition of certain substances now supposed to be elementary, such as calcium, which he considers not a simple substance, believing that the lines are due to *two* elementary substances of which it is composed, his supposition being confirmed by the fact that in Dr. Huggins's photograph only one of these lines showed.

Previous to this a note from Dr. Draper, of New York, had been communicated to *Nature* on spectroscopic photographs of the same star and others which he had been taking since the spring of 1872 by his twenty-eight inch reflector and twelve-inch refractor. He says in the spectrum of α Lyra bands or broad lines are seen quite differing from anything in the solar spectroscope. The research is difficult, owing to the time it consumes, through the long exposures required, and the atmosphere being so rarely in the best condition; the image of a star on a plate must be kept motionless for from ten to twenty minutes, and this necessarily is a great trial to subject ordinary astronomical driving clockwork to.

Our readers will be glad to hear that a supplement is being prepared by Mr. Robert Hunt to the last edition of that most useful of books, *Ure's Dictionary of Arts, Manufactures, and Mines.* Also, in connection with literature, we may call attention to a series of photographs—exact reproductions by the photoglyptic process of M. Goupil—from the photographic negatives which M. Corun had expressly prepared at the Polytechnic School from excessively thin plates of various feldspathic minerals. They were produced by the aid of the microscope, the Drummond light being the source of illumination.

A very useful paper has been published by M. Grisman (in *Zeitschrift für Biologie*) on the vitiation of air by combustion. He gives a series of tables which show—First, that under all circumstances and with artificial lighting the air of an enclosed space contains more carbonic acid and carbon-containing organic substances than it would if the illumination were absent. The practical result of his investigation is that petroleum oil occupies the foremost place for utility; it gives out less *carbonic acid* and fewer products of imperfect combustion. These facts are worthy of serious consideration in regard to dark-room or studio warming, as we cannot too much or too often impress upon photographers the desirability of using every possible means towards the purification of the atmosphere they live in.

(To be continued.)

Meetings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The usual meeting of this Society was held on Thursday, the 1st inst., the Rev. F. F. Statham, F.G.S., &c., in the chair. Messrs. Alfred Harman and Thomas Bolas were elected members.

Mr. William Brooks read a paper entitled *The Collodio-Bromide Emulsion Process Applied to Transparencies, and Enlarging Without a Nitrate Bath.* [See page 64.] During the reading of the paper a large number of fine specimens were handed round for examination.

The Chairman said that many who practised the collodio-bromide process seemed inclined to keep it secret to as great an extent as possible; the generosity with which Mr. Brooks had so freely recorded his experience contrasted strongly with such reticence.

Mr. J. T. Taylor was glad to be in a position to say his experience in that respect did not accord with that of their President, for on no subject had experimentalists displayed less reticence than on that of collodio-bromide. The hints, experiences, and suggestions that had, to his knowledge, been published were quite innumerable. He would also join issue with Mr. Brooks in the assertion that the cause of the waning popularity of the stereoscope was to be attributed to the number of trashy prints supplied. The true cause, in his estimation, was to be found in the imperfection of the instrument itself. Until stereoscopes of a similar description to the American instrument of Wendell Holmes were introduced, there was no chance of the stereoscope ever becoming popular.

Mr. P. Le Neve Foster, too, considered that to the form of the stereoscope was to be attributed its diminished popularity. In the American stereoscope the adjustments could be made without trouble, contrasting strongly with the clumsy instruments manufactured on this side of the Atlantic.

Mr. L. Warnerke had made several experiments with a view to obtain a variety of tones. He found that the tone depended greatly upon the exposure that had been given to the plate. The longer the exposure the plate received the warmer was the tone. Anyone who could produce a good negative was also able to produce a good transparency. He rather objected to transparencies on glass, as a means of obtaining the most perfect enlargements, on account of the blurring of the image. Transparencies obtained by carbon printing were free from that blurring, and, therefore, better adapted for enlarging.

Mr. J. A. Spencer (in reply to a question put by Mr. Brooks) said that the production of carbon transparencies was certainly a much slower process than that of transparencies by the emulsion process, and that instead of only ten minutes being required to produce a finished carbon transparency an exposure of several hours during the present dull season would be necessary.

Mr. Brooks questioned whether by means of carbon printing such delicate gradations in the distances could be obtained as by means of bromised emulsion.

Mr. Foxlee quite disagreed with Mr. Brooks in that respect.

Mr. J. T. Taylor observed that Mr. Brooks, in his paper, had recommended a substratum of albumen. He (Mr. Taylor) had had much experience with emulsion photography, and found that a substratum was not at all necessary. He had been some time ago shown a little "dodge" by Mr. Stillman by which, without any substratum having been used, the film adhered tenaciously to the plate, not only during development, but even during the subsequent treatment with nitric acid adopted in the production of a direct transparency, in the manner now so well known to all emulsion workers. The "dodge" in question consisted in rubbing the margin of the plate with a common tallow candle; the edging of tallow thus given completely prevented the liquids subsequently applied from getting under and thus disturbing the film.

Mr. P. Mawdsley had found the greatest advantage in the adoption of the tallow edging just described, and he felt certain that those who gave it a trial would not discontinue its use. He considered the suggestions of Mr. Brooks in regard to the modification of tones by the acetate of soda were of great value.

Mr. J. Nesbitt said the subject of Mr. Brooks's paper was one to which he had devoted much attention. He had brought several specimens with him to show the applicability of the emulsion process to the production of transparencies. [These specimens were handed round for examination.] Some persons imagined that it was impossible by this method to obtain a surface having an uniform degree of evenness and homogeneity with one produced by the nitrate bath. How unfounded this idea was would be seen upon examining a plate he had coated with emulsion, and which he begged to submit for critical examination. He had begun his collodio-bromide experiences by using the Liverpool emulsion; but, urged by the exciting articles on the subject in The British Journal of Photography, he had tried to manufacture his own emulsion, and had succeeded so well that he continued to do so. The process was a most fascinating one. The sensitiveness exceeded that of other dry processes, whilst the simplicity of the process was so great he was surprised that it was not practised by a larger number of photographers.

Mr. E. Dunmore, speaking of blurring, said that it might be prevented by so regulating the exposure and development of the original negative that there should be no bare glass.

Mr. Ayling had much experience with the exhibition of transparencies in the lantern, and had been greatly pleased with those that Mr. Brooks had thus exhibited at the preceding meeting. He had used the emulsion films prepared by Mr. Warnerke, and was delighted at the facility with which they could be used, especially in mountainous districts.

Mr. Henry had very little experience with wet collodion, and could only speak of the emulsion process. There seemed to exist a prejudice against the latter method which the exhibition of the specimens submitted that evening should remove.

Mr. S. Fry thought it would be interesting to his fellow-members to hear the opinion of one who, like himself, knew nothing whatever about emulsion photography. The results exhibited that evening had been so valuable that he was determined to lose no time in becoming acquainted with the process.

Mr. F. Howard said the question of tone in a transparency was a great stumbling-block. In his own experience he had found that by altering the time of exposure a considerable difference was made in the colour of the picture. The transparencies exhibited commended themselves on account of their excellent tone and clearness in the shadows.

Mr. F. York thought that transparencies printed by contact possessed a charm that was not present in those printed in the camera; and he saw no advantage, as respected rapidity, in emulsion plates printed in the camera. The chief advantage in emulsion printing seemed to be the variety of tone obtained.

The subject of tone as affected by exposure elicited further remarks from Messrs. Beasley, Warnerke, and Foxlee; after which,

Mr. Brooks said he was pleased to find that such an animated discussion had resulted from his paper. In reply to Mr. York, he maintained the sensitiveness and general rapidity of the emulsion plates as compared with those prepared by wet collodion.

A vote of thanks was unanimously awarded to Mr. Brooks; and the proceedings terminated by a fine display of transparencies, exhibited by the lime-light in the lantern, Young's oxygen generator having been employed on the occasion.

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PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

The Board of Management held the monthly meeting at the offices, 174, Fleet-street, E.C., on Thursday evening, the 1st inst.

After the despatch of the ordinary routine business, Mr. E. Lavender was elected a member of the Association.

The sub-committee then presented a petition for assistance which they had thoroughly investigated, recommending it as a needy case. Upon a motion the sum of five pounds was voted to relieve immediate distress, and steps taken to procure employment for the applicant.

Some of the members then dwelt on the desirability of making better known the advantages of the Association to its members (members' applications for assistance only being entertained), the subscriptions being fixed at such a rate that all persons engaged in photography are enabled to support it.

There being no further business, the meeting was adjourned to Thursday, the 1st March, at eight o'clock p.m.

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GLASGOW PHOTOGRAPHIC ASSOCIATION.

A general meeting of this Association was held at the Religious Institution Rooms, on Wednesday, the 31st ult.,—Mr. George Mason, Vice-President, occupying the chair. A number of pictures from the recent Edinburgh exhibition were on view. The minutes of the previous meeting having been read and confirmed,

The Chairman intimated that there was no regular business before the meeting, the members having merely been called together to give them the opportunity of again viewing a number of the finest pictures from the late Edinburgh exhibition, which had been kindly sent to them by the committee, and he had no doubt the Society would be gratified to see they had a few of their Edinburgh friends present with them, namely, Dr. Nicol, and Messrs. Tunny, Pringle, and Sinclair. He would suggest, before sitting down, that the members should make observations on anything in the pictures which struck them as worthy of notice.

A peculiarity was noticed in the group of the *Clergy of the Cathedral Church of Neejmy* (No. 84 in the catalogue), by A. Kareline. A strange effect of light was observed on the hat of one of the gentlemen in front, the light striking it on quite the opposite side from all the others. Whence this light came no one could discover.

Dr. Nicol said it had already puzzled some of the best photographers in the country, who had seen it in the exhibition.

The Chairman thought the hat had been put on by combination printing.

Mr. Urie fancied the negative had been touched up on the back, the retoucher in doing so having made a mistake by touching up the hat on the wrong side.

Mr. Tunny combated this opinion by declaring he believed that none of the lights seen in the picture had been touched in, and to him they all seemed quite natural.

Mr. Urie said that if the lights were natural it should have struck the beards of the gentlemen behind, as it had done those in front.

Mr. Tunny, however, again pointed out that the persons behind were in partial shadow, being evidently out of the direct line of the light; and he thought that if the artist had touched in the lights, as Mr. Urie suggested, he would have worked up the back figures a little, and made them more like those in front. He was inclined to think, with the Chairman, that it was the result of a second printing.

A Member observed that perhaps it had been done intentionally.

Dr. Nicol inclined to this opinion, pointing out that Kareline had shown himself to be too clever an artist to be likely to make a mistake of that kind, and said that perhaps it had been done to elicit discussion and notice. He (Dr. Nicol) then drew the attention of the members to another of Kareline's pictures, entitled *Blind Man's Buff*, in the centre of which was a window from which he thought all the pictures had been lighted, the prize picture included—*Portrait of Mr. and Mrs. Zelenetzky* (No. 775). It would perhaps give them an idea of his mode of working.

Mr. Urie, referring to the gold medal picture (No. 775), characterised it as a very peculiar and clever production, and wondered where the light in it came from, which left the gentleman so beautifully in shadow and yet so full of detail. It was very artistic, but he would like to know how the effect was produced.

Dr. Nicol, on being appealed to, was unable to give any decided explanation, but stated that it formed the subject of a paper written by Mr. Norman Macbeth, which he had only that evening sent off to head-quarters—a duplicate of which he had taken the precaution to seal up lest he might be tempted to open it; for before he entered the room he anticipated that he should be questioned on that very picture. He thought it would be a breach of confidence to open it, and by waiting they would all likely be able to see the paper in good time.

Mr. White thought there was another window in the room beside the one whence the light seemed to come, and from which a light was caused to shine softly on the shadow side of the gentleman, the detail being thereby all got up. The exact position of the window he could not determine.

Mr. Tunny also believed that such was the case, the light giving the detail so beautifully on the shadow side of the gentleman being evidently a top one, and situated between the camera and the sitter. He thought the shadow part on the side of the lady's dress was got by exposing it a few minutes to the sun after the picture had been printed in the frame; that reflectors had been pretty extensively used; and that altogether there had been a good deal of dodging to get up the effect. As to the backgrounds being so uniform in tint, he could not see how they could be produced so uniformly without having recourse to double printing. He understood that some persons were inclined to think the pictures were extremely artistic, but had little of real photography about them.

Mr. Pringle held that the picture had been taken upon two negatives, the joint being either about the white window curtain or the panel in the background, and thought the lamp in the background had been *drawn* in. He (Mr. Pringle) stated he had examined the whole picture very closely through a magnifying glass, and observed a good deal of working up and dodging. He had observed also a scratch or break hardly discernible by the naked eye, and was afraid that one of the negatives was broken, though he hoped not, as he believed copies of it had been sold at the Exhibition that were yet to be delivered. He called attention to a smaller picture by the same artist which, to his mind, showed more artistic talent than the larger one. He (Mr. Pringle) concluded his remarks by saying that not for the prize picture alone, but for his whole collection, Kareline deserved the gold medal.

At this point it was proposed to terminate the discussion, in order to allow Dr. Nicol to describe the famous so-called "pyramid camera" of Professor Piazzi Smyth, which was on the table along with his "cloud camera."

Dr. Nicol then gave a very able, succinct, and popular description of these wonderful and interesting instruments, explaining their principal points—such as their want of focussing glass; their somewhat larger size than was really seemingly needed, which he explained was to prevent fogging by sunlight; their combined sensitising bath and dark cell or slide, wherein the plate was kept during exposure, to prevent drying up in the hot, dry climate. He said that to get perfectly parallel plates of glass was the first great difficulty, which had been overcome, though not without a good deal of trouble, by Messrs. Chance. It would be seen, he said, that in a negative of such small dimensions (about one inch square) the least want of parellelism would spoil the negative for future enlargement. He further explained that six combined baths and cells were taken by Professor Smyth, the exposing of which number was considered a good day's work, and he believed there were rarely any failures, five out of every six negatives generally proving good. The instrument was a Dallmeyer locket lens, and had been specially selected from a great number sent on approval. The cloud camera he (Dr. Nicol) said was a rather uncouth-looking object, but Professor Smyth was one who cared more for utility than beauty. The lens was used with full aperture, but had a plano-concave corrector placed as near the prepared plate as possible, by which means perfect focus was obtained all over the plate, with the addition of great rapidity. The ingenious blue glass finder, to give an exact idea of how the clouds would appear in the negative, was pointed out, also the spring to permit the getting of quick exposure.

Mr. Pringle inquired if the plano-concave corrector would be likely to come into general use.

Dr. Nicol explained that, as it needed to be precisely the same size as the plate upon which the photograph was to be taken, he was afraid it would not. For ordinary purposes it would prove too expensive, but he thought it might yet be adopted, to good purpose, for small work.

Mr. Tunny expressed his gratification at having been one of Dr. Nicol's audience, as it was the first time he had heard such a full description of the pyramid camera. He had appreciated it much, and he felt certain so did the other gentlemen. Just at the time Professor Smyth was exhibiting his series of views by means of the lantern in Edinburgh, he (Mr. Tunny) had only just returned from a trip to the pyramids, and to him the picture of the so-called sarcophagus inside one of the pyramids was a wonderful production, showing it much more distinctly than was otherwise the case by ordinary tourists. As shown by Professor Smyth its sides exhibited plainly the chips caused by the desecrating hands of the curiosity-hunter—some evidently long since done and covered all over with a deep layer of dust; others being recent, and upon which the dust had not yet time to collect.

Dr. Nicol explained that the picture of the so-called sarcophagus or rather cobbe chest was taken by means of the magnesium light, and said he thought the exposure was from about twenty to thirty seconds. Only one negative per day could be taken of this curiosity, in consequence of the dense smoke evolved in burning the magnesium in powder and wire.

Mr. Robertson (the Secretary) expressed himself as exceedingly sorry that the President (Mr. Stuart) was not with them that night, as he was sure he would have been delighted to have seen the pictures, met his Edinburgh friends, and listened to Dr. Nicol's description; but he felt certain that if not with them in the body he would be with them in spirit. The Association must feel themselves deeply indebted to the gentlemen who had come from so great a distance, and he hoped they would give them a cordial recognition of their esteemed kindness. He proposed to give them a hearty vote of thanks.

Dr. NICOL, in responding, said it had given himself, and he could speak for his friends too, very great pleasure to be once again amongst their Glasgow brethren, and he had no doubt that if the Edinburgh Photographic Society should ever at any future time require the services of their Glasgow friends they would be willingly given.

The CHAIRMAN said he thought he expressed the sentiments of all present when he stated that one and all had enjoyed their communion heartily. To those gentlemen who were unable to go to Edinburgh during the exhibition the pictures then on view would prove of great interest, as they were the very choicest of the collection; and all must have felt that in listening to Dr. Nicol's clear and able description of Professor Smyth's wonderful instruments they had had a treat of the very highest order.

The meeting was then adjourned.

Correspondence.

FEBRUARY MEETING OF THE PHOTOGRAPHIC SOCIETY OF FRANCE.—PRESENTATION OF THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC FOR 1877.—REPORT ON VIOLET-COLOURED GLASS, &c., FOR SITTING ROOMS. —REMARKS ON DITTO.—PRESENTATION OF FATTY-INK AND CARBON PROOFS BY M. BRAUN.—NEW LENSES BY M. PRAZMOWSKI.—GREAT SILVER MEDAL AWARDED TO M. JANSSEN.—M. FRANCK DE VILLECHOLLE ON TRANSFER OF CARBON PRINTS.—A NEW WASHING APPARATUS, BY M. COLLET, OF CHERBOURG.—PHOTOGRAPHIC LITERATURE: APPEARANCE OF A NEW TREATISE BY M. DAVANNE.

THE Photographic Society of France held its monthly meeting on Friday evening last, the 2nd inst.,—M. Davanne in the chair.

After the election of new members and the reading of correspondence, I offered to the Society, in the name of Mr. J. T. Taylor, the Editor, THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1877.

M. PERROT de CHAUMEAUX, in reply, said he had no need to make a long speech in recommendation of the book. If it was equal to that of the previous year it spoke for itself, and the names of the contributors were a sufficient guarantee that it was so. A vote of thanks was given to the Editor (Mr. Taylor) for his presentation. The ALMANAC was passed round in order that the members might see the photographic portrait which it contained. I need hardly add that it was very much admired.

A report was then read by M. Ferrier from the commission appointed to judge of the merits of the violet-coloured glass or composition which M. Scotellari had "invented" for lighting the sitting-room. The report was not in favour of the invention, and expressed the opinion that the advantages were not of sufficient value to counsel its general adoption.

I would here close all further discussion on the violet light, as did the Society on Friday, after having heard the report of their commission; but I must say more, because great divergence of opinion exists on this subject among Parisian photographers. Some are enchanted and others are not convinced. That the photographic members of the Society who were chosen to give their appreciation were not satisfied with the results I can fully understand, and they did right to make an unfavourable report; but whether they are mistaken in so doing is the question. In order to clear up the matter, I must state the advantages as set forth and claimed by M. Scotellari for the violet-coloured rays:—

1. He claims a shortening of exposure of at least fifty per cent. 2. That better modelling can be obtained than with the white light, so that with its employment retouching is hardly necessary. 3. That the portraits made in or by the violet rays are more faithful and truer to nature than those made in the ordinary light, because, he says, the violet rays having a calming influence upon the sitter the features remain more calm and more natural. 4. That from an artistic point of view the negatives made exclusively by the agency of the violet rays have a finer and deeper *modelés*. More details are to be seen in the high lights, and a greater depth to be found in the shades; in fact, the portrait leaves the hands of the operator having a much superior artistic appearance than one obtained by the ordinary *modus operandi*, &c., &c.

It can be seen that M. Scotellari claimed very much; it was, then, natural that such good news should excite the photographic community at large, for a mode of shortening the time of exposure has been the general desire of earnest photographers for a very long time.

In answer to the first claim I can say (having made it a point of duty to be present at every experiment made by the commission, if peradventure I might find something to interest the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY) that although a rapidity such as the author claims was not attained, still rapidity was in favour of the violet rays (from five to ten per cent). With respect to the second claim I confess that a better picture is obtained; the high lights and shades are blended harmoniously one with the other. But at anyrate retouching is necessary. As regards the third claim I am completely of a different opinion. Did it calm nervous persons I would say immediately to my readers "by all means employ the violet light." It is just in this circumstance resides its principal disadvantage, for which it would require very much gain in rapidity to compensate—the glare is very fatiguing to many. As respects the fourth claim I grant that many of the advantages stated are correct. Then why, it may be asked, did the commission not succeed in the experiments undertaken by them to prove its value? The answer is very difficult to give, for the source of non-success may be attributed to many causes—too numerous to be enumerated—one of the principal, in my judgment, being that the trials took place—all of them—upon very dark, dull days. I believe great superiority can only be obtained in fine weather. In a previous communication to THE BRITISH JOURNAL OF PHOTOGRAPHY I said that for the violet light, no matter how intense the light, no blinds are required to soften its action. If this be not the case how can the divergence of opinion which exists here be understood as to the merits of the violet light?

As a specimen: M. Carette, a wholesale chemist, who has an experimental studio, and is a gentleman in whose good faith I have every confidence, wrote a very flattering letter to M. Scotellari on the admirable results which he had obtained by the violet light. He (M. Carette) stated that he had obtained negatives in two-thirds less time than with the ordinary light, with which he always exposed sixty seconds, and that since his studio had been transformed by M. Scotellari he required only to expose twenty seconds.

The commission hearing this went the next day and several negatives were made in my presence—it is true with a little advantage in favour of the violet, but not to be compared with those obtained the day before, and certified as true by M. Carette's operator. M. Liebert then invited his colleagues and myself to return home with him to make a trial in his studio, the half of which he had had arranged with M. Scotellari's violet-coloured composition. His courteous invitation was accepted, but the results were similar to those obtained in M. Carette's studio.

I can only account for the non-success—if non-success it can truly be called—by the state of the weather. It is very hard to believe that a man like the inventor would leave a flourishing business, losing so much of his valuable time, and that some photographers will no longer work without its aid, if there were not something really good in it. The idea must not be thrown aside as of no value because at the first few trials it did not give the results claimed by its author. The latter is a Christopher Columbus—fervent and tenacious in his opinion of the future success of his discovery.

I would propose that some of the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY, who can easily procure some violet-coloured glass, should make a kind of square tunnel by placing roughly together a few panes; then put the picture of a statue at the end and reproduce it; then replace the violet-coloured glass, and give the public the final result of the experiment. I believe that for the reproduction of old pictures and old photographs the violet-coloured rays will be found very valuable. I have my opinion on this fact. Many years ago I myself succeeded in obtaining a pencil drawing upon a yellowish paper by projecting coloured light upon it. Let any of my readers choose an old photographic portrait as yellow as possible, and interpose between it and the light a piece of violet glass: the portrait will have the appearance of having been toned but a few hours previously.

To sum up: nothing is yet proved in a satisfactory manner as to the value or otherwise of the violet-coloured rays in replacing the white in our sitting rooms. Time alone will prove this, and, by degrees, its value; for as one or two photographers have found it good, it will slowly but surely make its way into other studios if an advantage be found. The inventor at present is obliged to daub over the glass of the studio an alcoholic solution of a pure violet colour; but he says it would be better to employ violet-coloured glass if it could be procured of a pure violet tint.

To return to the doings of the Society. M. Braun made a presentation of a very fine collection of fatty-ink proofs, as well as another of carbon, representing a great number of the celebrated pictures in the Museum of Amsterdam.

M. Prazmowski presented some very small and highly-finished panoramic lenses, similar to those made by the celebrated houses of Ross and Dallmeyer.

M. Janssen, the celebrated astronomer, was presented with the large silver medal of the Society for the progress he had made in astronomical photography during the last few years.

M. Franck de Villecholle made a communication to the Society on the best support for a carbon proof intended to be removed from the glass. He said it was collodion containing a little castor oil. The proof is covered with the said collodion, and when dry a knife is passed round the image, which immediately rises from the glass. It can now be kept flat by placing it between the leaves of a book.

M. Collet, of Cherbourg, presented a very simple apparatus for washing silver proofs by a mechanical means, in order to eliminate all the hypo. very rapidly. The value of this apparatus is that it is self-acting. The proofs never remain in the same place, but turn round the tray or tank all the time. By its aid more complete washing is secured in ninety minutes than by the old system in upwards of twelve or fourteen hours. The apparatus presented to the Society resembled a very large shower-bath tray about a yard in diameter and about six or seven inches in height. A brass tap is placed near the bottom to draw off the water when required. Another tap at about three inches from the top edge serves as an overflow tap to let off the surplus water. In this large, round tray a similar one is placed, only a little smaller, so as to allow (when lowered into the other) about an inch of separation. This latter tray is only supported on the other at the top by means of a large flange. A great number of holes are punched in the bottom of the inner tray. It is very easy to see that if water be poured into the inner tray it must work its way through the holes, and then up the side to make its exit through the overflow cock. In this manner proofs put into the tray, and a current of water allowed to play upon them, would be well washed with a little personal attendance; otherwise they would get all of a heap, and so prevent the water from dissolving the hypo. M. Collett was not contented with that result, so he imagined a new "dodge" to do away with personal labour and attendance. On one of the sides of the tray he fixed a small zinc overshot wheel, about a foot high, to the circumference of which, and at equal distances, were attached four paddles a little curved at the ends. A small stream of water is allowed to run from an india-rubber tube into the buckets of the water-wheel, which then begins to turn. Each paddle now strikes the water softly, entering about an inch, and resembles the hand of the operator. Sometimes it strikes the water, and sometimes it comes in contact with a proof without the least injury being done to the latter. Thus a circular current is established, which does the office of an attendant, and at the same time washes the proof.

I have just received a new book on the photographic art, bearing the title of *Les Progrès de la Photographie.* I have not yet had time to peruse it, but when I state that it was compiled by the *savant,* M. Davanne, its value and merit will at once be seen. It was intended as an appendix to the well-known photographic guide, written by MM. Barreswil and Davanne, under the title of *La Chimie Photographie,* which book has had a legitimate success during many years. The supplement, although intended to be bound up with the other, is apart. It contains a summary of the principal improvements introduced into photographic manipulation within the last few years. I cannot do better than recommend this book to the perusal, as well as to the study, of experimentalists and amateurs.

3, Place Bréda, Paris, February 6, 1877. E. Stebbing, *Prof.*

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CARBON TISSUE AND THE FARGIER PROCESS.

To the Editors.

Gentlemen,—Although I believe I was the first to suggest the development of a carbon picture upon a washed collodion film, *with a view to the separation of the picture from the glass plate, with the film adherent,* and insisted strongly upon the advantages possessed by collodion so employed in preserving the delicate tones of the picture, I am desirous not to claim, nor to have claimed for me, more than I am entitled to.

At the time referred to by your correspondent "Alcestis," although I succeeded perfectly in obtaining the same amount of gloss as that presented by an albumenised paper print by removing the picture from the glass after immersion in water, and so obtained very perfect results, I missed the goal I was so nearly approaching—viz., that of readily obtaining pictures with the full surface of the glass plate—by omitting to wax my plates before collodionising. This blot was promptly hit by your correspondent "Collodion," in your issue of January 6th, 1871, who wrote:—

> "Take a plate of opal glass, one side ground, and rub over it a little white wax, warming the plate sufficiently for this purpose. When cold coat with collodion, allow it to dry as though you were going to place it in a silver bath, wash well under a tap, and lay your exposed tissue face down on the collodion; allow it to stand a few minutes, and it is ready for development."

It is a pity that this letter was not signed with the name of the writer, as it will be seen that it literally describes the very method which is now being so extensively employed for the production of small work in carbon, and which yields the brilliant, glossy prints so much in vogue.—I am, yours, &c., John A. Spencer.

9, Grafton-road, West Kensington,
February 6, 1877.

To the Editors.

Gentlemen,—Your fair correspondent "Alcestis" seems to have omitted a very important detail when she writes that, in the subsequent treatment of her picture—that is, after sensitising and printing—she makes use of that modification of Fargier's process said to be introduced six years ago, and which consists in coating a glass plate with collodion, rinsing with water, and applying the pigmented tissue. If "Alcestis" did this only I think she would not have been able to send any prints to the worthy Editors.

I have a first edition of the *Autotype Manual* by me, bearing date 1869, and at page 40 I find development on wet collodion treated of as appertaining to Mr. Johnson's patents for development on rigid support; but it was perfectly well known at that time that pictures so developed could not be persuaded to leave the glass, and it remained for M. Lambert to demonstrate that if the plate were treated with a fatty or repellent body, then coated with collodion and subsequently washed, the pictures could be developed safely and perfectly, and would, when the transfer paper had become dry, leave the glass with the most splendid lustre.

If "Alcestis," therefore, has been successful in obtaining perfect transfer from a washed collodion plate *without* previously treating it with some repellent body, she will have achieved what has before been considered impossible; and if she will favour the readers of your valuable Journal with her *modus operandi* she will add to the favour already conferred upon your readers.—I am, yours, &c., Nemesis.

February 6, 1877.

To the Editors.

Gentlemen,—The letter of "Alcestis" in your last issue suggests a few thoughts.

I suspect that I am not one of those who can be looked upon as a "man of energy," for when a new thing is presented to me as a certain means of making my fortune, or trebling my business, at the very least, I do not rush off immediately and spend my ten, twenty, or thirty guineas for instruction in the new fashion, and for licence to use the wonderful innovation; but am content to bide my time, and see whether those who go in first are satisfied with their bargains, or whether they are content to consider themselves relegated to the list of those who proverbially soon get parted from their money.

Now, among the novelties of the last year or so the really very beautiful pictures called "chromotypes" occupy, perhaps, the first rank; and though I did not intend to give up silver printing just yet, I find that if I do not somebody else will get the best part of my business—my neighbours coming out so strongly with their patent chromotype I determined not to be left any longer in the background. Accordingly I resolved to adopt the process; and, as the most authentic mode of being acquainted with what I was given to understand was protected by a patent, I sent to the Patent Office, and for the sum of fourpence bought the specification of the patent in question.

To my astonishment I find the process described in that patent is simply that which has been published in your own and other photographic journals years ago, and that, moreover, it is not even claimed to be patented in the specification referred to, but that something else which is *not* a "chromotype" is declared to be the object of the invention. What *is* claimed in the specification in question is best described in the patentee's own words:—

> "Having described the nature of the invention and the manner of performing the same, I declare that *what I claim as the invention to be protected by the hereinbefore in part recited letters patent* is—1. The intensifying or strengthening bath, composed as hereinbefore specified, for obtaining *clichés,* as set forth. [This refers to a bath of permanganate of potash and sugar applied to strengthen the intensity of a *negative* obtained by printing from a transparent positive on to carbon tissue, or to the strengthening of such a positive in order to impart greater brilliancy to the negative to be obtained from it.] 2. The method of obtaining the bordered support or ground in any desired tints or subjects on which the carbon picture is to be produced, as specified." [The method described to obtain the ornamental border desired, in imitation of marbling, leather, &c., is to copy such designs, and from the negative so obtained produce a number of prints in *salts of silver* for subsequent use.]

A suggestion is made, though not specifically claimed, whereby lithographs on fine paper may be employed as the backing to the chromotype picture; but this is of very minor importance, and never likely to be employed.

It would, therefore, appear that the chromotype pictures are really not claimed as "patent" by the author of the specification, and that, therefore I, and I have no doubt many others, have been suffering from a simple "scare." I have a very decided distaste for infringing any one else's rights; but, on the other hand, if I find a portion of the common upon which I have been accustomed to turn out my sheep to graze enclosed by another man, who puts up a notice against trespassers, I am tempted to use somewhat strong language to designate his assumption of ownership.—I am, yours, &c., Broomielaw.

February 7, 1877.

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RE "WINCHESTER QUARTS."

To the Editors.

Gentlemen,—I have several of these non-special articles. They are dark-blue glass bottles with a stopper, and hold an undefined quantity. I do not think that I have two of the same capacity. I never use them except for purposes where no *particular* measure is required. I use them for silver bath solution (measured properly into them), for distilled water, spirits of wine, &c., &c.; but I never trust to them in making up any important compound.

Many of our first writers on photographic subjects say—"Take so-and-so and put it into a Winchester quart, and fill up with water or distilled water." I beg to say that I have been more than once deceived by this formula. The Winchester quart is an absolute fiction.

If any one is desirous to benefit his fraternity why cannot he say so many ounces or pints, so that his intention may be easily understood?—I am, yours, &c., W. A. Parkyns.

Harnham Cliff, Salisbury, February 2, 1877.

EMULSIONS AND DEVELOPERS.

To the Editors.

Gentlemen,—I have read your account of Mr. Gray's success with an alcoholic gelatine emulsion with much interest, as he appears to have been experimenting in a similar direction to myself—that stated by me in the last volume and in the Almanac. It appears that Mr. Gray has succeeded where I failed. I can well imagine that if the proportion of water in the gelatine emulsion were very small an even film might be obtained without difficulty. But how does Mr. Gray obtain this highly-alcoholised emulsion?

I know it is said that gelatine will dissolve in moderately-strong alcohol if the former contain a trace of water. With this knowledge, I was surprised to find that a Kennett emulsion would not bear an equal addition of methylated spirit, sp. gr. ·823, without precipitating the gelatine when cool. Can Mr. Gray account for my failure? I succeeded far better with an ammonium-bromide emulsion, the bromide being in excess in the first instance. If the methylated spirit were first added the excess of silver nitrate might then be used with impunity or left out, as desired. The emulsion prepared with excess of silver nitrate *in the first instance* would not bear the addition of the spirit. I think it likely that an emulsion made as mentioned above would stand the addition of a very large proportion of alcohol. But I should like to see stated the *rationale* of being able to add alcohol in some instances and not in others.

I have been attempting a collodion emulsion with zinc bromide. I say "attempting," because I have met with difficulties in more ways than one. In the first instance the bromide, which was obtained from a well-known manufacturer, when dissolved and diluted to a considerable extent gave a copious precipitate of a basic salt. What the nature of this salt is I do not know; but it would lead to uncertainty in emulsion use—not merely because the equivalent would not be that of the theoretical atomic weight (of which more anon), but also because the salt may have its own reaction with silver nitrate, and if the bromide salt be added in the dry state to the collodion a pure precipitate will be formed which may seriously interfere with the mechanical perfection of the emulsion.

I have stated that the "equivalent" would not agree with the theoretical atomic weight. It is, no doubt, always wise to test every new sample of any bromide whatsoever, but, I opine, especially so in the case of a salt like zinc bromide. To begin with, its symbol is $Zn\ Br_2$; this gives an atomic weight of 225, as stated in the table at the end of the Almanac. My last volume of the Journal is now at the binder's, but I think Mr. L. Warnerke gave 106, or nearly so, as the combining equivalent of zinc bromide. However this may be, on testing the salt I arrived at a nearly similar conclusion.

Believing that the basic salt was the cause of the unsatisfactory mechanical condition of an emulsion, as well as not countenancing an impurity in unknown quantity, I dissolved the whole of the sample of bromide. A very little water suffices to do this, but it will be necessary to add a large quantity of distilled water in order to cause the whole of the impurity to separate into a flocculent precipitate. When, on trial, this was found to be the case the solution was filtered and evaporated down, the strong solution being transferred to a porcelain crucible to effect the drying of the bromide. When this bromide showed no trace of moisture on continuing the heat cautiously, stirring all the time, three ounces of an alcoholic solution were made, so that ten grains would be in each drachm of the solution. This, on dilution, showed no trace of a precipitate, and the dried salt is lighter in colour. The atomic weight, according to this solution, is 117·4. Well, here is a pickle for a simple photographer to get into! And how about that oracle at the end of each volume of the Almanac? In two or three instances it appears to require revision. But, if the symbol for zinc bromide be not $Zn\ Br_2$, what is it? I will leave this part of the question to abler heads than mine.

To return to the emulsion: it was made with a papyroxyline kindly given me last spring by Colonel Stuart Wortley. I still find that a washed emulsion made with it splits up on drying on the plate, or, at least, on drying after development. I have tried the addition of sulphuric acid, in the proportion of one minim to every eight grains of the papyroxyline, hoping to effect an improvement, but without success; and, unless it can be proved to the contrary, I believe I am right in stating my conviction that a high-temperature pyroxyline is not the best for a washed emulsion. In this opinion I am aware that I am not alone. I have now obtained a cotton which I know should answer, and I hope now to form a highly-sensitive washed emulsion.

I am much interested in the welfare of the new claiment for the attention of the amateur photographer—sodic hydrosulphite. I say "amateur" advisedly, because we cannot expect the new comer to gain that attention which has been denied by the profession to the "old stager"—ammonia. I shall be glad to get rid of the fumes of ammonia, provided we lose nothing in chemical energy and effect.

I would suggest a trial of calcium hypophosphite—$Ca\ (H_2\ PO_2)_2$ This salt, from its tendency to pass into phosphate by absorbing oxygen, is a powerful reducing agent. I write from the "book," and not from a personal experience of the salt. It is produced by boiling phosphorus with calcic-hydrate, or lime-water.

I wish to revive a question on which I wrote to you somewhat over a year ago, namely, the physical change produced in a film of silver iodide when it is coated with a solution of a bromide and heated. The effect is to produce a transparent film *apparently* without trace of silver haloid. A similar effect is to be seen if we take a bromide film and scatter ammonium bromide over it: in the course of a few minutes clear, transparent spots are formed, varying with the sizes of the particles of soluble bromide which have caused them.

Now, how is this fact to be explained? I would suggest that the silver salt is soluble in the strong solution of soluble haloid, in the same manner as silver chloride is soluble in excess of common salt. We know how soluble bromide, when in large excess, causes a very fine precipitate of silver bromide. May not this be due to the dissolving action of the soluble haloid on the silver salt? I can imagine that the silver bromide is dissolved in part as soon as formed, to be precipitated again in fine division in proportion as the emulsion loses its soluble bromide. If this theory be correct it will be better to pour the silver into the bromide, rather than conversely, as sometimes recommended.—I am, yours, &c.,

Cotheridge Court, Worcester, Herbert B. Berkeley.
February 5, 1877.

ENAMELS, AND CARBON PRINTING IN AMERICA.

To the Editors.

Gentlemen,—My attention has been directed to a letter, signed "Jo. Vestris," which appeared in the last issue of your contemporary. The reason why I adopt the somewhat unusual course of asking space in *your* pages to reply to that letter is to be found in the fact that my communication upon which such letter is founded was published only in The British Journal of Photography, and not in the contemporary in which "Jo. Vestris" ventilates his opinions.

As far as I am aware, I am the only enameller who visited the Philadelphia Exhibition at the time M. Lambert was in that city; and I may here thank "Jo. Vestris" for the very flattering compliment he pays me by his designation of "great enameller," but, at the same time, correct an error into which he has fallen when he states that "I gave my opinion that the climate of America was too hot for carbon work." I only reiterated the statements of Mr. Gutekunst and Mr. Carbutt, and drew attention to the failure M. Lambert experienced in the studio of the former gentleman.

Perhaps as "Jo. Vestris" seems to know more of other people's business than they do themselves, he may be able to explain why the Woodbury process is not successfully worked in America. If I am correctly informed, several gentlemen in America purchased the Woodbury patent, but could not work it on account of the climate. Mr. Carbutt informed me that he had, or was devising, an arrangement for cooling and drying the tissue.

For the truthful enlightenment of "Jo. Vestris" and other friends of that pseudonymist I will state that I only offered my *published patented enamel process* to one American photographer, Mr. Gutekunst, whose offer for a single studio license I declined, although the sum was considerably in excess of the large sums offered by English photographers.

I need not speculate as to the identity of "Jo. Vestris." He may or may not, for all I care, be a disappointed exhibitor, a Lambert admirer, an unsuccessful vendor of enamel or other processes, or a tool of some clique; but the remarks of this writer remind me of the well-known story of the photographer who, on being told by a client that having been victimised he would never recommend any of his friends to him, met the unfriendly allegation by the rejoinder—"Very well, then, if you won't send any of your friends send those against whom you have a grudge, in order that I may serve them out as I have served you." Has "Jo. Vestris" been victimised?

I would recommend this gentleman to follow my example and take a trip to the United States, spending five days in New York and five in Philadelphia (where he should not fail to see Gutekunst's fine work); visit Buffalo, Niagara Falls, cross Lake Ontario to Toronto, and see Ewing's factory; sail down the St. Lawrence to Montreal (where he should visit the studio of Notman, and also see the fine productions of my namesake); cross the White Mountains to Boston; visit Providence, Rhode Island; then by steamer back to New York, recross the Atlantic to London—all within six weeks, having visited all the principal studios *en route*, and kept an unprejudiced eye open. If he do this he will then be able to form an opinion as to the time he would have had to demonstrate or vend a process; he would, at all events, find something more interesting to write about than the subject that has instigated me to pen this.—I am, yours, &c., A. L. Henderson.

49, *King William-street, London,*
February 5, 1877.

Photography in Court: Peasland *v.* Guggenham.—Jules Guggenham, described as a photographer of High-street (Oxford), was summoned by Henry Peasland, an operator, who had been in his employ, for non-payment of £2 12s., balance of wages. The summons stated that defendant had employed complainant on the 6th of December, at the weekly wages of £2. On January 20th defendant left him. During that time he received £11 on account, leaving the balance claimed. Defendant pleaded that complainant had never fulfilled the engagement, which he did not deny having entered into with him. Complainant deposed that he entered the service of defendant on the 6th of December last. He produced the letter requesting him to come a month on trial as operator, at a salary of £2 per week. On the first Saturday after he came he received his wages for the three days, and his expenses. On the following week witness was paid £1 10s., defendant saying that he had not enough money by him to pay the whole. On the following week £1 was paid him, and the next week 15s., the same excuse being given. This system continued till he left defendant's service, when the total balance owing to him was £2 12s. He had never heard any complaint as to the manner in which he did his work. Defendant declared that complainant was not able to do his work, and that on the last day he agreed to come on the following week at half-price, but he did not do so. Complainant admitted having made this agreement, but stated that he was engaged as an operator, and the work complained of, which defendant alleged he was unable to execute, was new work, altogether apart from the duties of an operator. Notwithstanding this fact he entered into the agreement, which he afterwards refused to carry out, acting on the advice of his father. Defendant alleged that he complained daily of the manner in which complainant executed his work, and also of a number of articles which were broken, as he believed, by defendant. These articles included five or six glass funnels, a focussing glass, worth 25s., and a host of other articles; in fact, it was "break, break, broke, broke." Complainant denied breaking the funnels, and also stated that the focussing glass was in a proper condition when he left defendant's employ. Defendant here asked complainent whether he did not tell the servant girl in a dark room that there was no God nor devil in this world, but the question was ruled to be irrelevant. Complainant further stated that directly after he left his situation he received an insolent message from defendant, to the effect that a quantity of chemicals were missing. The Bench expressed regret that defendant had been so foolish as to put himself to all this expense. Complainant had earned his money, and must be paid, and he would leave the court with a character unsullied. Defendant was ordered to pay the amount, and also the costs.—*Oxford Times.*

EXCHANGE COLUMN.

Wanted, a seven and a-half inches focus Dallmeyer's rapid rectilinear lens in exchange for microscope or musical-box.—Address, W. E. H., 34, Deansgate, Manchester.

Wanted, a Ross's No. 1 *carte* lens or No. 1 symmetrical lens, three inches focus, in exchange for a Harrison's head-rest. Difference adjusted.—Address, S. Arlidge, photographer, Kettering-road, Northampton.

The work, *How to Choose a Microscope*, is offered in exchange for The British Journal Photographic Almanac for 1876 or 1875.—Address, J. Monteith, 10, Bute-street, Aberdare, Glamorganshire.

I will exchange two whole-plate porcelain baths, one half-plate ditto, stands and dippers complete, and a quantity of cameras and lenses, for a good posing chair or background.—Address, H. George, Bracknell, Berks.

I will exchange a Ross's 15 × 12 large-angle doublet, with tube and skyshade, new (cost £14 16s.), for the same maker's rapid symmetrical or Dallmeyer's rapid rectilinear.—Address, J. M. Carroll, 51, Derby-lane, West Derby, Liverpool.

ANSWERS TO CORRESPONDENTS.

Photographs Registered—

E. T. Hicks, Liverpool.—*Portrait of the late Richard Cobden, M.P.*
Charles Spence, Lerwick.—*Two portraits of the Rev. James Ingram, D.D.*

☞ *Correspondents should never write on both sides of the paper.*

Chambers and Co.—Received.

Textile Fabric.—Common table salt is chloride of sodium. You should obtain and study some elementary work on chemistry.

Carboniensis.—Your are quite correct in your estimate; there is a great deal of energy displayed in connection with the carbon process of printing in Glasgow and its vicinity; and some of the portrait work we have seen in that city is very fine.

S. G. F.—It seems to us that a good method by which to render the dish serviceable would be to make it warm, and while in that state to apply a coating of thin shellac varnish, by means of a flat camel's-hair brush. Or it might be lined with very thin india-rubber.

Collodion (Glasgow).—Since writing our answer in the last number we have ascertained that the various kinds of cotton prepared by Messrs. E. and H. T. Anthony and Co., of New York, can be obtained in this country from Mr. J. J. Atkinson, Manchester-street, Liverpool.

Omega.—Among the formulæ for developers given in our Almanac for the current year is one which will answer your purpose. It is one in which advantage has been taken of Mr. M. Cary Lea's recent discovery of the restraining properties of gelatine when specially prepared.

J. H. M.—The only suggestions we have received that seem to meet the case point to there having been rather too little solution in the fixing bath, and that in consequence of this the prints had been allowed to touch each other in certain places, in consequence of which they were imperfectly fixed at these places.

A. A. C. Swinton.—The photograph received is very creditable to so young an amateur. It is, however, quite impossible to indicate how long it will last. Divide the silver bath into two equal parts, and to one of these add about a drachm of nitrate of baryta. Next take pictures with each bath and compare the results.

A Neapolitan Photographer.—1. The business notes in your letter will receive immediate attention.—2. The only process of which we are aware in that connection is the gum-gallic one. Is that the process to which you allude?—3. We shall next week give our opinion of the prints.—4. Lee Brothers, Watling Street. Thanks for kind offers.

R. L. Allan.—No definite work on photolithography has been published; but a large mass of most valuable information upon this subject is scattered throughout the twenty-three volumes of this Journal that have been published. If you have mastered the details of the preparation of the transfer, it is probable that by studying a treatise on ordinary lithography you will in this manner obtain all the information required.

Geo. Smith.—To lengthen the focus of your portrait lens, marked A, so as to make it correspond precisely in focus (equivalent) with the lens B, it will be necessary to separate the lenses a little. The amount of separation requisite to effect this assimilation must be determined by experiment; but it will probably exceed half an inch. Be guided by the following:—The nearer the lenses in a combination are mounted together the shorter will be the equivalent focus of that combination.

"Frilling" of Gelatine Negatives.—"S. G. F.," writing on this subject, says:—"Although a constant reader of all photographic literature, I have never noticed the following 'dodge,' which in my hands has been very successful it preventing 'frilling' in any gelatine plates that, from one cause or another, may be troublesome in that way:—I noticed that in nearly every case frilling starts from the edges of the plate; I therefore ran an edging of strong india-rubber solution round the plate before placing it to soak. This I found most effectual in a batch of plates that, through some mismanagement on my part, left the plate all over in the most hopeless manner. In one or two cases frilling started from the centre, but as a rule it was a perfect cure. I also find it advantageous, in several suspicious cases, to merely rinse the plate from hypo., then dry, and again soak in a mass of water, to *thoroughly* remove hypo. Doubtless this has been known to many, but I never saw it published, and no harm whatever can be done by trying it."

Cracked Picture Varnish.—"A Poor Artist" has met with a grievance which is of a seriously annoying character, and which we allow him to describe in his own language, in the hope that some suggestion may be made by some readers who have had a similar experience:—"Twelve months ago I received a commission to paint two portraits, 20 × 16; these were painted in the winter, and in May last were varnished with Rowney's mastic varnish. Having received another commission from the same family, I called a few days ago to match the frames, when you may judge of my horror at finding my two fine paintings with a network of cracks all over them. I used the varnish just as supplied to me by the colourmen, and found it extremely stiff and difficult to lay on. Besides the cracks in the varish I found several iridescent patches. Can you, Messrs. Editors, or any of your correspondents, inform me what is the cause of these defects, and also advise me as to the best means of removing the varnish now on the picture without injuring the painting. An early reply in your Journal will no doubt be of value to others, as well as conferring a great favour on myself."

Received.—G. W. Webster, F.C.S.; *Street Life in London.* Critical notices of the latter and other works in our next number.

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Photographic Society of Great Britain.—The annual meeting of this Society will be held on Tuesday next, the 13th inst., at 5a, Pall Mall East. After the routine business connected with the occasion and the election of officers, Mr. H. Baden Pritchard, F.C.S., will read a paper on *Photography from a Holiday-Maker's Point of View.*

APPLICATIONS FOR NEW PATENTS.

January 11, 1877.—"Production of Carbon and Other Permanent Photographic Pictures." No. 142.—H. Lambert.

January 26, 1877.—"Photography" (communicated by D. Scotellari and G. Puttemans). No. 337.—H. J. Haddan.

METEOROLOGICAL REPORT,

Observations taken at 406, Strand, by J. H. Steward, Optician.
For the Week ending February 7, 1877.
These Observations are Taken at 8 a.m.

Feb.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks.
1	29·99	W	48	49	52	36	Dull
2	30·11	SW	50	51	52	48	Dull
3	30·27	W	38	40	50	37	Hazy
5	30·36	W	39	41	51	35	Hazy
6	30·31	W	49	50	54	40	Dull
7	30·13	W	51	53	59	49	Cloudy

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 876. Vol. XXIV.—FEBRUARY 16, 1877.

DEVELOPMENT AND THE TONE OF TRANSPARENCIES.

The question raised by Mr. Brooks, in his paper read before the members of the South London Photographic Society, with regard to the addition of certain salts to the developer for the purpose of modifying the colour of the deposit, is one to which we have for some time given considerable attention, though we had not previously used the two substances named by Mr. Brooks. While that gentleman's object has been to secure a pleasing tone for transparencies, our own efforts have been in the direction of a good printing colour for negatives; and though the immediate intention is different the principle is identical in each case, and the results obtained sufficiently marked to remove any doubt as to the practical advantages offered by the adoption of such a course.

Mr. Brooks confines himself, according to his paper, to the use of acetate and phosphate of soda; but the list of substances capable of modifying the character of the deposit may be extended almost *ab libitum* amongst organic as well as inorganic compounds. We have confined ourselves chiefly to substances of an organic nature, as these appear to answer better for the purpose we had in view than the latter, though it is extremely probable that inorganic substances will prove most suitable when the only object is to produce a change in the colour of the image without any accession of density.

With regard to the organic matters we have employed in this manner experience leads us to state, generally, that the effect produced upon the image by the addition of any particular substance to the developer is similar in character to that which would result from the use of the same substance as a preservative, though the action differs considerably in degree. With certain organic compounds, however, a separate action is set up which may, to a certain extent, counteract or modify the other—as, for instance, in the case of tannin, which, when applied as a preservative or organifier, exerts a very distinct effect upon the colour and density of the resulting image. When the tannin, however, is added to the developing solution another action comes into play, namely, its restraining power, which, as we have on previous occasions remarked, is very considerable; and this, by prolonging the development and giving, as it were, an effect of under-exposure, brings about a material alteration in the colour as well the delicacy of the deposit.

In the discussion which followed the reading of Mr. Brooks's paper it was truly remarked by Mr. F. Howard that the tone of the picture is greatly influenced by the relative length of the exposure given, but it is extremely doubtful whether the fact can be utilised in the slightest degree. With a given negative a certain length of exposure is necessary in order to secure the best rendering of the subject; and if that exposure be either increased or diminished in order to modify the colour, some of the grades of half-tone must necessarily suffer. We say this, bearing fully in mind all that has been said and written on the subject of the latitude in exposure allowable with dry plates; for we have a strong opinion that that latitude should be confined to negative work. When we come to transparencies, the range of tints between clear glass and the deep shadows—if the latter are to be free from heaviness—is so limited that greater care is necessary in the matter of exposure, in order to preserve the due gradation of half-tone. By the restraining action of tannin the development is prolonged in a somewhat similar manner, and the result is that the shadows become dense and heavy before the finer shades make their appearance. When used in very small proportion the effect is pretty good, especially with negatives inclined to flatness, the deposit partaking of the well-known brown colour met with in tannin plates.

The question here arises as to how far the effect produced is similar under the two methods of applying the toning agent, and whether it is due to some action of the agent upon the sensitive film or merely to a modification of the deposit formed by the developer. We are inclined to believe in the latter view, though reasons may be deduced in support of either side. Thus, it is well known that if an organifier be employed which gives a characteristic colour to the image, it is found that if it be washed off the plate after it has been allowed to act for a short time, and the plate dried, exposed, and developed, the resulting picture will still exhibit some of the character due to the organifier employed, from which, it may be supposed, that a specific action is exercised by the organifier upon the silver salt composing the film. But against this it may be urged that the effect is due to the presence of traces of the organifier which have been allowed to remain on the film; for, in general, where the organifier is washed off the film the amount of washing the latter receives is totally inadequate to penetrate the pores of the collodion and remove all the soluble matter it may have absorbed during, probably, several minutes in the preservative bath. The film upon drying contracts, and so seals up any remaining organic matter that the subsequent washing, previous to the application of the developer, fails again to remove it, and, becoming gradually diffused throughout the developer, it produces the effect usually attributed to its action upon the film previous to exposure.

In the course of a number of experiments we have been able to establish this as a fact in connection with several organifiers in general use; but others, notably tannin, appear to exert a more permanent action upon the film itself, though this result may perhaps be rather due to these being more difficult of removal. Plates prepared and treated with an organifier in the ordinary manner were washed and left to soak for various periods extending over several hours, with the result that in proportion to the prolongation of the soaking the characteristic features of the organifier became less and less apparent in the developed image, until, finally, the effect ceased to be perceptible. In the case of tannin, and to a less extent with one or two similar substances, the image developed after a soaking of twenty-four hours was clearly distinguishable from one produced upon a plate which had received no organic treatment. The difference was less in regard to colour than to a greater clearness and vigour exhibited by the soaked plate; and, if it be considered that the tendency of the prolonged soaking would be to bring increased softness by removing the soluble haloid, it must be plain that the difference is due to the influence of the organifier.

Our object in these remarks is to endeavour to show the possibility of obtaining by an addition to the developer the peculiar effects of any particular preservative when circumstances do not admit of its use as a preservative, or when the preparation of the plate is beyond the control of the operator. In certain cases it will not be found practicable to use the organifier in combination with the developer, but these instances will be few and far between. With such substances as are compatible with alkaline pyro. we have succeeded perfectly in securing the desired result, the chief and, indeed, only difficulty resting in the necessity for the exercise of some little care in adjusting the proportions of the matter added, though this when once overcome need give no further trouble.

Amongst the numerous substances which take part in the formation of preservative solutions we have used—in addition to tannin and gallic acid as adjuncts to the ordinary developer—must be included albumen, gelatine, gum arabic, dextrine, honey, sugar, glycerine, beer, and various infusions, including tea and coffee. The result of our experiments has been to prove to us that the addition of any of these substances to the developer brings about an entire alteration in the appearance and character of the deposit, and, where the organic substance exerts any peculiar action when employed as a preservative, the same effect is almost invariably produced by its use during development. It is not necessary for us here to enter into minute details as to the precise action of individual organifiers; suffice it to say that the results are frequently of value in correcting or improving slightly-faulty images, for which purpose it is to be inferred that each of our readers will select his own favourite preservative.

For the purpose of improving the tone of transparencies a wide field of research is opened, and a large addition made to the list of substances which may be pressed into service. From a hurried trial of the two salts mentioned by Mr. Brooks we are inclined to be of opinion that inorganic, rather than organic, substances promise the best results, as they produce less increase of density, while they modify most materially the colour of the image. We shall be able to report more fully upon the matter in a week or two.

HOLIDAY PHOTOGRAPHY.

On Tuesday evening those members of the Photographic Society of Great Britain who were present at the annual meeting of that body had their attention directed to the subject of *Photography from a Holiday-Maker's Point of View*. This is a topic replete with interest to a large portion of our readers, and the interest, never quite dormant, revivifies as soon as the lengthening days intimate the return of spring.

Mr. Pritchard, in dealing with this subject, recommended the adoption of a pocket camera suitable for plates of 5 × 4 inches, which, together with three double dark slides, or a roller dark slide for use with Warnerke's negative tissue, might be carried in a satchel upon the back without inconvenience. The stand he preferred was one that, when folded up, formed an alpenstock, and the plates used by him were those prepared by one or other of the bromised emulsion processes now so well known. He exhibited pictures printed direct from the small negatives he had obtained, together with enlargements of great excellence which had been made from these negatives, and the camera, slides, and stand he employed were also exhibited.

Recent events have proved that an important future awaits the production of small pictures of a suitable character either to be esteemed and retained for their own intrinsic value or to be employed in the production of enlargements. And to this, as a leading idea, we desire to direct attention from the tourist's point of view.

The difference between a photographic tourist and a tourist photographer may be defined in this way:—The former starts on his tour taking with him suitable appliances for securing reminiscences of the scenes of his wanderings, of which appliances he avails himself as often as he feels prompted by his taste or inclination. With the latter the production of the photographs is the main object of his peregrinations. The former makes everything subservient to his comfort and pleasure as a tourist, and to do this he must be epicurean in his photographic tastes. This is our ideal of a photographic tourist.

Pocket cameras are at present in the ascendant, and these are being constructed with a special view to the requirements of the traveller. We shall now allude briefly to what has been already effected by cameras of this class. We have in our Publishing Office an untouched picture, twelve inches in dimensions, so sharp and full of gradation as to have elicited from professional photographers an expression of dubiety as to its being an enlargement from a small original. Yet so it is. A picture of the same dimensions if taken direct would possess no advantage whatever over the one in question. But only consider how great would be the difference as respects the convenience and comfort under which the two negatives would be taken! A camera in which 12 × 10 negatives are to be produced is necessarily bulky and heavy; that for a quarter plate can be stored away with its lens and double dark slides in the coat pocket. No photographer who values his comfort will now think of taking with him on a tour a camera of such dimensions as those in vogue a few years ago. We may here add that we should be glad to show the picture to which reference is above made to any reader calling at our office.

It is, however, in the improved processes now placed at the command of the tourist that the latter will experience the full advantage. We have examined under the microscope a transparency taken near the summit of Snowdon on a bromised plate, developed by the alkaline process, and then treated with nitric acid in the manner first indicated by Major Russell, the result being a transparency obtained direct in the camera, and possessing such an amount of sharpness that when enlarged to fifty diameters much of the details quite invisible to the unaided vision became clearly delineated. It is a well-recognised fact that from a good transparency any description of picture may be easily obtained; and this is the class of work whose production we are now advocating. The employment of a bromised plate is imperative, so also is the development by the alkaline method. The picture, when plainly visible in all its details, is flooded with nitric acid, washed, exposed to light for a few seconds, and treated with the previously-used developer, when a vigorous and intensely sharp transparency is produced.

While *en route* the tourist, if he be wise, will prepare and develope his plates. There are many circumstances which favour the utilisation of plates previously prepared by and obtained from any of the recognised dealers; but for tourists travelling on the continent it has been found more advantageous to purchase plates prepared on the other side of the custom-house barrier of the country in which they are about to travel. Thanks to Mr. Bolton and others, the preparation of sensitive dry plates is now a matter of so little moment that one may safely enough defer taking any thought concerning it until shortly before bedtime on the evening previous to taking the field with the camera.

ON TRANSFERRING NEGATIVES.

The growing importance of carbon—which every week gains fresh converts, all of whom praise the results it gives while acknowledging the trials and difficulties that beset the beginner and are by no means absent from the operations of the proficient, as witness the recent discussion at the Photographic Society of Great Britain—renders important every hint that can facilitate easy working and diminish labour and, as a consequence, cost. The very beautiful results in matt obtained by the double-transfer process are pronounced by many to be the most artistic outcome of any carbon work as yet produced, and there is no doubt that the delicate surface when perfectly transferred, and shown side by side with either the ordinary carbon surface or the highly-glazed collodionised print, possesses a subdued and chaste beauty which would incline us to give our preference in the same direction.

But there are so many real or supposed difficulties in the way that the majority of workers use the single transfer process for all their work possible, more especially for enlargements. There is, however, one class of enlargements which often falls to the lot of photographers to undertake that gives an immense amount of trouble in every way. We allude to the reproduction and enlarging of positive copies of various kinds—old *cartes*, glass positives, daguerreotypes, *et hoc genus omnes*. When once a negative of this class is taken it is a great saving of labour in the after processes to be able to print at once without the use of the double transfer; and, as such work usually requires the intervention of the artist in water or oils before it is issued to the client, the use of single transfer gives more freedom of choice as to how the work is to be ultimately finished.

But to make use of the single transfer it is necessary to have non-reversed negatives, which, in the large establishments that have sprung up since carbon printing has become *un fait accompli*, are usually produced direct by either a plane silvered mirror or a prism. This adjunct, so frequently alluded to by us, is, however, not yet a common accessory of the enlarging room, and hence other means must be had recourse to—that is to say, practically, the negative must be transferred; but the fear of the labour and risk in doing this is so great that it is not often undertaken, the double transfer being considered the lesser of the two evils. It is, however, more particularly the transferring of negatives after drying that takes up much time, and requires materials not always at hand and some amount of practice to attain proficiency; for, if the recently-finished and not-yet-dried negative be operated upon, the transferring is a matter of great simplicity, and, at anyrate with small negatives, unaccompanied with any risk, the only requisites being a solution of citric acid and a dish of scrupulously clean water. It is not even necessary to employ citric acid solely, nitric or sulphuric being suitable, though our own experience leads us to prefer the first named.

The *modus operandi* is simplicity itself. The negative, well washed, is covered with a strong solution of the acid—say twenty-five per cent.—which is allowed to remain for two or three minutes, the time being immaterial. It is then washed off, care being needed now to avoid injuring the film, for a great change has by this time come over it. In place of being, perhaps, highly adherent it has become quite loose and skinny, there being apparently no adhesion whatever between it and the glass. It is now in a fit state for transferring and reversing. Slipping the negative carefully, face down, into a dish previously filled with water free from all floating particles, it will be found that the glass can be drawn away with the greatest ease, leaving the film floating in the water quite uninjured. If a glass plate had been placed beforehand at the bottom of the dish it then needs only care rather than dexterity to raise the plate and carry the film with it, thus forming a reversed negative. In the actual carrying out of these details there is little or no difficulty. This method is one commonly made use of in the studio of a practical carbon worker in copying the class of work mentioned, and he finds it especially useful in enabling him to print on any paper that artists have a preference for, such as Whatman's, &c. He now invariably adopts a carbon basis for coloured work.

The chief drawbacks of these reversed films is their liability to crack and fly off the glass when dry, the cause being evident upon inspection of a loose piece of film. The side originally next to the glass is, as might be expected, perfectly smooth and glass like, while the other side—that is, the one which received the first action of the developer—has, comparatively speaking, a dull matt surface, which does not allow that perfect exclusion of air which would cause adhesion by "suction." The remedy is to prepare the second plate and give it a surface which shall make up for the deficiency of adhesiveness in the film itself.

This may be done by either of two methods. First, by preparing the plates with gelatine and chrome alum, as though for a carbon transparency on glass, in the manner first published in these pages by the gentleman referred to above, and afterwards appropriated in the usual manner by others. But this method of preparation necessitates the use of a previously-prepared glass, while we have spoken of using only what is found in any studio—a point of considerable advantage in assisting in the introduction of new processes. We describe a second method, therefore, not open to this drawback. It consists simply in coating the plate that is to receive the film with ordinary collodion (iodised or uniodised), washing it under the tap, and then proceeding as above.

A tendency of the film to leave an unprepared glass may be predicted when—First: The development and intensification have been prolonged. Second: When oyster-shell markings exist. Third: When the collodion is of an unusually contractile nature. Fourth: If bubbles of air have been allowed to become imprisoned under the film—a contingency which could only arise through carelessness. Fifth: If the film have been allowed to pucker and twist at all before finally lying on its glass.

One other point should be alluded to. If the glass upon which the negative is first produced had a roughened margin it will be necessary to cut or tear the film away as far as the roughening extends, or to loosen it carefully with a camel's-hair pencil. We need not add that, when the negative is taken purposely for transferring, a plate without the roughened margin is to be preferred.

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PROCESSES.

Although in our last number we took leave of the recent photographic exhibition in Edinburgh, so far as special notices were concerned, we think that some practically useful information may be deduced from a perusal of the catalogue, the prize list, and the general criticisms written on the exhibits, especially in the direction of the kind of processes employed in the production of the pictures, and particularly as regards the question of the relation of wet and dry plates.

The circular issued by the Society to intending exhibitors contained a request that, amongst other information, the process by which each picture was produced should be stated on the back. Presuming that the request, on the whole, was reasonably complied with, and understanding that in compiling the catalogue the process was entered whenever it was other than wet collodion, we have an opportunity of arriving at a tolerably accurate understanding of the proportion of wet and dry work in the late exhibition.

A rough analysis of the catalogue shows that of some 1,100 frames, 719 were presumably by wet collodion; 220 in carbon, principally enlargements, though there were a number of frames of small direct work in Lambertype and chromotype; while 45 were photo-mechanical prints by one or other of the various processes; leaving just 116 dry-plate pictures, as the term is generally understood. Tabulated as follows they will appeal more forcibly to the eye, and enable us to deduce from them some thoughts that may not be altogether without value:—

Fothergill	15	Coffee	9
Gum-gallic	8	Emulsion	13
Collodion-albumen	22	Platinotype	11
Dry plates	20	Woodburytype	6
Photo-mechanical	39	Carbon	220
Tissue	3	Wet collodion	719
Beer and albumen	15		

Notwithstanding the undoubted fact that much of the carbon work was said to be of the very highest quality—and in many cases not only equal, but superior, to what, under like circumstances, could have been obtained by silver printing—it is quite clear that much yet remains to be done before it attains to the popularity carbon deserves. But leaving it aside we have the curious fact that, notwithstanding all that has been written on dry processes, the convenience and certainty with which they may be worked, and the admittedly fine results they are capable of yielding, they were shown only in the proportion of 105 to 719 by wet collodion, or a little more than twelve per cent.

Such a result must at first sight be somewhat discouraging to those who have worked so hard and written so much to advance dry-plate work; but a little consideration will show to a certain extent how it may be accounted for. Photographic exhibitors must always include two classes—those who exhibit to secure fame or to show the progress being made in the art. and those whose object is mainly to advance trade interests. The latter class will consist—to a large extent, at least—of professional photographers and the former of amateurs, although we know there are many professional artists to whom fame is dearer than pecuniary acquisition. Under these circumstances the professional element will always form a larger aggregate in our exhibitions than the amateur, and as a very considerable proportion of professional work is composed of portraits—a department which dry collodion has hardly yet invaded —it is not to be wondered at that not more than twelve per cent. of the pictures at our exhibitions consists of dry-plate work. Leaving portraits, then, for this reason out of the question, let us glance at the medal list as applied to landscape work, and see whether there is a crumb of comfort for those enamoured of dry-plate photography.

The Edinburgh Photographic Society offered six medals—three silver and three bronze—for the three best and three second-best landscapes of certain sizes and classes. Two of the silver medals were awarded to Mr. William England and Mr. George Panton, respectively—the former for a print from a dry plate, the latter from a beer-and-albumen plate, and one only to a print from wet collodion, by Mr. Payne Jennings. Of the bronze medals, one went to Mr. George Wardley for a print from a collodio-albumen negative, one to Mr. R. J. Muir for his beer-and-albumen work, and one to Mr. H. A. H. Daniel for a print from a wet collodion negative. The two medals offered to amateurs were gained by Mr. R. Crawshay and Mr. John Parker for wet collodion work, thus fairly dividing the honours between wet and dry collodion, and that, too, in presence of the fact that the number of exhibits in the former class very far exceeded those of the latter.

Let the devotees of dry plates take courage from this, and persevere in the effort to reach a still higher standard of perfection, assured that the future of landscape photography, if not also of all photographic work, will lie in the direction to which their efforts are sedulously devoted.

But, curious as is the fact that dry-plate work bears such a small proportion to that of wet collodion, it is, we think, even more curious to find how poorly emulsions are represented. For a number of years they have, so far as processes are concerned, almost monopolised such space as the journals could afford. We have most ample evidence that work of the very highest class can be got with them; and yet of eleven hundred frames only thirteen have an emulsion origin. Emulsion workers, however, need not be discouraged; the pictures by Mr. Henry Cooper, Mr. Peter Mawdsley, and Mr. W. B. Woodbury were each in their way gems of photographic art—in most cases superior to what, under the circumstances, could have have been done with wet collodion. It must not be forgotten that the pioneers of a process—those by whose research and experiment it ultimately reaches to something like perfection—do not generally belong to the exhibiting class. They are satisfied with the honour and pleasure which always attends their labours, and leave to others the fame and fortune which may result from the practice of what they have helped to make perfect.

The emulsion process in one or other of its various forms is certain to make its way; and we have little doubt that in the next international exhibition it will be represented in a very different manner.

There can be no doubt as to the correctness of the suggestion made by our correspondent, Mr. H. B. Berkeley, in our last week's issue, with regard to the action of the soluble haloid in producing an extremely fine precipitate of silver bromide in emulsion; indeed, we thought that the fact had been already fully recognised. The chloride, bromide, and iodide of silver are, as Mr. Berkeley surmises, soluble to a slight extent in excess of the haloid employed in their formation as well as in excess of silver nitrate, and it would appear from their behaviour under different conditions that the order of their solubility is reversed according to the solvent which may be in excess. Thus it would appear that when free silver is the solvent the iodide is most soluble and the bromide less so, and *vice versâ* with free haloid, the bromide probably occupying, as it almost invariably does in similar reactions, the middle position between the iodide and chloride. Though we are not prepared to say positively that such is the case, looking at the behaviour of bromide and iodide in emulsions probability is given to the supposition; for, while excess of the haloid, as we have stated, gives an extremely fine deposit of bromide of silver, an excess of silver is almost a necessity in order to keep the iodide in suspension at all. The behaviour of silver chloride, however, if it does not weaken the theory at least lends no assistance in strengthening it, for it appears to act in much the same manner as regards emulsification, whether excess of bromide or of silver be present. This may possibly be due to a closer approximation of the solvent action of the bromide and silver respectively rather than to a departure from the usual order of things. With regard to silver bromide, it will be found that in proportion as the excess of nitrate is increased so will the haloid be precipitated in a state of finer division, but with this difference as compared with excess of bromide—that the precipitate rapidly loses its fineness and passes into a comparatively coarse state, the dried film having the well-known dusty appearance on the surface. This, however, is to be ascribed rather to the action of the silver upon the collodion, and, through it, upon the sensitive haloid, than to its direct action upon the latter. We are unable to say anything at present upon the cross action of the different haloids such as that which Mr. Berkeley inquires about, but when time shall permit we may probably work out some notes made on the subject while experimenting with the chloriodo-bromide process some time ago.

MR. KARELINE'S WORKS, AND WHAT MAY BE GATHERED FROM THEM.

[A communication to the Edinburgh Photographic Society.]

No one who has witnessed the very admirable collection of photographic works, lately exhibited in the Royal Academy National Gallery, could have failed to notice, on entering the first room, a few very remarkable specimens of figure subjects taken in direct sunlight.

When they first came under my eye I felt that here we had a thorough mastery of light and a kind of treatment of it which was certain to give a fresh impulse to the art, and clear away many difficulties which have seemed to be insurmountable, especially in the way of development.

Mr. Kareline (the photographer to whose works I allude) is a Russian, and I have much pleasure in taking this opportunity of congratulating him on his success in winning the gold medal of the Edinburgh Photographic Society for the picture which, in the opinion of the Judges, possessed the highest degree of merit, irrespective of size or subject.

The number of the work (according to the catalogue) which was selected was 775. It was chosen as the best embodiment of Mr. Kareline's skill and general treatment. There were other works by this gentleman which were perhaps finer in focus and sharper throughout; but for simplicity, good taste, fine arrangement, and breadth of effect the work securing the first prize stands alone. Altogether it is one of the best expositions of the general principle which seems to govern all Mr. Kareline's effects, and the chief object of this paper is to point out what appears to me to be his aim, wherein his success lies, wherein he is deficient, and the general lessons we may thus gather.

Mr. Kareline is evidently no novice in his art. His work generally manifests considerable culture, and he is apparently well acquainted with the best-acknowledged theories of composition.

The picture for which the award has been made, and to which I would now call your attention, is in size (the picture proper) seventeen and a-quarter by twenty inches. It is upright in form, and based upon the same composition as that to which Burnet, the engraver, calls our attention to when he refers to a special picture of the Dutch school. The picture consists of a figure in light costume placed over a dark background, and another in black placed over a light one.

The subject is a domestic one, but, strictly speaking, it is portraiture treated under a familiar aspect. A husband and his wife are seated in their parlour at tea. The window of the room is visible, draped with white muslin curtains; the farthest in line of the curtain forms (vertically) almost an equal division of the picture, constituting one-half of the space in light and the other in shade. The lady is dressed in a light-coloured silk, with lace *tablier* over the chest and skirt of dress. She is seated and exposed to direct sunlight over the shaded part of the background. Three-quarters of the face and body are in shadow, but under the influence of strong reflected light. The gentleman is seated close to the window, dressed in a dark-grey tweed suit. His face and body are so situated in shade that they form one entire mass, and that lying over the light, composed of the window and curtains. One unacquainted with art—and especially with the expression of such strong relief as is here presented—in attempting to do such a thing might completely fail in having the composition united; but Mr. Kareline showed his skill when, by the introduction of the little table placed between the two subjects, the objects lying on it—cup, saucer, and tray cloth (being light)—join at the window on one side and on the lady's dress at the other. The objects otherwise throughout the picture, which serve to lead off the light and fill up spaces, are also skilfully arranged, and that without being too conspicuous. For instance: the great mass of shade in the back of the room is subdivided at a very fine *forte* point of this space by the introduction of the oil-lamp bracket and its globe. Had not that been there its want would have been felt, and the picture appear to be out of balance. Then, also, the seat of the chair behind the lady laterally distributes and carries away some of the light, which, without it, would preponderate on the lady's dress.

The treatment of lines also in this composition is interesting. The lady, holding an album, and the gentleman, unconsciously in the act of holding a cup (to appearance, by their unity), the lines of the arms may be said to resemble the inner lines of the capital letter M, while the main lines of the body of each resemble the outer lines of the same letter.

It is of the greatest importance that a distinct basis exist in every composition. Architects well know the value of this; the more that we can resolve upon a distinct form, by whatever way it may be suggested, the more is our design likely to be original, well connected, and varied. Mr. Kareline pays great attention to variety of forms, even in one subject. In the prize picture we have little or no repetition. The lady's head looks toward the spectator, while the head of the gentleman is in profile and looking towards the lady. The aërial perspective of all Mr. Kareline's works is also worthy of remark. In the particular work under notice, while the extremes of light and shade are brought into juxtaposition there is yet no violence. The lady's figure, by her light dress being placed over the shaded part of the room, becomes connected with the background by her hair, which, being darker than the shade of the wall, appears sufficiently well made out and, at the same time, graduated.

There are several of Mr. Kareline's works which are in better development throughout than this. Some of the shadows have not the light fully taken up in them, and there is a defective part in the wall of the background which has been restored, evidently by stippling. Upon the closest inspection this picture appears to have been printed from a negative directly taken, and not a combination. It is very little, if anything, touched up, and never has any work been more entitled to be classed among those of which the motto holds good—"It is the highest art which conceals art." Visitors to the exhibition (unacquainted with the art) have been greatly disappointed with this work at first sight, and wondered what was to be seen in it. Painters and photographers, again, admire its simplicity of treatment, and the latter are generally puzzled as to the manner in which Mr. Kareline manages his light.

But I believe there is no mystery in that; unquestionably Mr. Kareline employs powerful reflectors, and at the same time has great regard to the fulfilment of natural effects. Of late many methods of the treatment of light have been introduced, such as those styled "Rembrandt;" but the style has been too apparent, too oft repeated, and too artificial. However, it was a step in advance, and infinitely better than those effects which were the result of a glass house without any concentrated light, producing no shadows, and consequently no light predominating. But here—and it is one of the chief merits of Mr. Kareline's work—the main source of light is strongly marked by direct sunlight, while all the parts are in shade under the influence of treatment by reflection. The development of sunlight on the lady's face in this picture, however, has partially failed—that is, there is not a complete realisation of her complexion by reason of too dense a deposit being thrown on these parts, from which we may infer that the negative has been a little short in exposure; but in most of Mr. Kareline's work—for instance, in that of his own portrait—it is the development of the flesh tints and the manifestation of the highest lights on fine linen or glistening objects, such as silver or crystal, that make his works very singular. I believe the mystery of his method lies more in chemistry, and by a process of development which, if I may hazard a conjecture, it is probable that after careful study of his arrangement, both of subject and accessories—everything prepared for action—the lens is opened and the sitters subjected to very short exposure (if not instantaneous); and by a method of development—say such as Mr. Mudd pursues in the application of plain pyro. to collodio-albumen plates—all the detail is made manifest previous to rendering by silver the respective density of parts, according to their exposure to light, or like that of Captain Abney's more recent discovery in his process of development by the application of emulsion, through which he brings out the most latent impression of very short exposure.

Although the photographer can never lay claim to any merit in the formative part of his work by drawing, and certain other high departments of fine art which are a necessary concomitant of the painter, who has to represent his own individual impressions of character—to invent a style and produce qualities of texture and colour unlike nature, in fact, and at the same time be charmingly like in appearance (some comparisons are odious, and such work as we have now indicated should never enter into comparison with photographic work proper, which, in that department, has no art in it, being purely a reflection through the lens)—yet who does not see what a boon it is to every student of art as well as of nature to have in our hands such perfect translations of facts as we have had presented to our notice so recently. However, there are corruptions in every art, and nothing is so much to be deplored in photography as the now too common habit of working on the negative, destroying surfaces, and thereby losing all that is so real and authentic.

I fear, however, it is hopeless to expect any renunciation of working on the negative so long as the development of the highest lights and, in particular, of skin is not better manifested than it is at present. It is in the department of light and half-light (the latter being the region of colour) where development comes most short.

I have no objection to any amount of skill or art being rendered on positives if people will prefer them so; but let them be classed as what they really become—photographic art-miniatures. I maintain that it shows a weakness in the photographer when he has recourse to this practice with a view to make up deficiencies of which both he and the public are fully conscious. It is the apparent absence of this in Mr. Kareline's work which forces me to acknowledge the superiority of his productions, fully demonstrating that the faintest light lying in the deepest shade may be secured, while at the same time the highest lights, even in sunlight, are kept free from solarisation, and are, consequently, vigorous.

I should like to have dwelt longer on this topic, as one of the things in particular from which we may gather much, as expounded by the works of Mr. Kareline. Suffice it to say that the danger into which many photographers run appears to me to be the notion that strong relief is of the highest and only excellence; and, either unconsciously or through inexperience, the tendency, by modelling on the negative, is to go to excess with it, changing the natural moisture of the skin into the appearance of the sitter's face having been oiled, or producing the appearance of a white porcelain surface, giving no representation of the individual's complexion. It is a complete fallacy to suppose that such work—seeing that, at its best, it is but mongrel in its character—will ever attain to be classed as high art; fine it is, if mere minuteness be considered of the right kind. It is not in that sense, however, that fine art is to be considered, for in painting (as a representative art) mere fineness is not regarded as good art, but rather otherwise—as poor and vulgar; and, on the other hand, roughness—the other extreme—is not regarded of itself an excellence. It is the amount of truth which is imagined by surface rendering, and the extent to which it is suggestive, that constitutes the excellence of such manipulation; and if that be difficult in large work with the painter, how much more difficult and precarious must it be for the photographer who attempts such expressive work on surfaces much more minute! Photographic work in itself is not representative; it is the most positively realistic manifestation of a pure reflection, and should infallibly present nothing beyond what is before the instrument excepting what may be treated by light on the positive. It will take some time before the public will see the importance and force of this; but it is the duty of every photographer to pursue the most legitimate methods of production which are in strict accordance with its own scientific bearing. For, rest assured, the more perfect a transcript of nature can be made through photography—that is, by light and chemical development without extraneous aid—the more will it be confided in as an auxiliary to art and be highly prized under any circumstances, but more especially when parties who have been photographed shall have ceased to live.

Having thus analysed and pointed out the merits of Mr. Kareline's prize work, I shall now rapidly glance at some of the rest of his works differing from this in character. Mr. Kareline forwarded above twenty separate frames, besides two portfolios containing smaller works, all giving full scope for judging of his general capabilities as a photographer. His *Portrait of Platonoff* (No. 776) is, perhaps, the best specimen of portraiture proper which he has sent to the exhibition. The subject is not placed in sunlight. The white dress is managed with much breadth of effect, the position is simple but vigorous in action, the character strong and well sustained, and the tone of the flesh (especially in the arms) is finely realised, and that, I have no doubt, through much judgment. This, of all his works, is the least photographic in appearance. The accessories are very simple, and the aspect of the portrait is altogether not unlike those by Sir Joshua Reynolds.

I have already made reference to Mr. Kareline's own portrait (No. 800). It was taken in the open air, in sunlight. He is standing with a sketch-book in hand, looking for an idea. He has on a black felt hat, which casts a broad shadow over the face. A plaid over the right shoulder is relieved by the shadow of some dark space, like a door, while the black hat is relieved by a wall of broken plaster in sunlight. I should have liked this head to have been a little farther up in the light, preventing the lateral line of the door from affecting the repose of the head. This is one of the things which I presume to think Mr. Kareline should guard against, for apparently in several of his works extraneous objects of no important bearing on the subject are permitted to molest much beauty. For instance: in a place (in one of his pictures) where a party plays at blind man's buff, the elegance of design in the figures which compose the group is completely marred by the framework of screens and windows in the background constituting lines at right angles to each other.

I find these defects in several of his works, which are very painful to the eye. There is one cabinet portrait (No. 488) in which the gentleman is seated at a table running parallel to the base, and at right angles to the side of the picture, without being softened or counteracted by objects lying more or less acute. This portrait of himself is, apart from the objection of which I have been speaking, a fine specimen of the kind of work in which I imagine Mr. Kareline will yet do wonders, and I would strongly recommend him to pursue this walk as unquestionably that wherein his strength lies. This picture is certainly the finest illustration of his power in development. The completeness of forms in shadow is very admirable, showing Mr. Kareline equally master of shadow as well as of light.

Before closing I must call attention to Mr. Kareline's cabinet portraits. They are very excellent in the realisation of many of the qualities to which I have alluded, such as still life; but his employment and treatment of such, and the extent to which he does so in this department of portraiture, is what I would take most exception to. I think there is too much attempted. Of course the figures in every case are well arranged, full of purpose, and completely developed; but there is a profusion of ornament and furniture which, although common to cabinet works, yet (such as is here employed) to some degree swamps and absorbs all human interest by their attractive forms, and in some instances by their light and spotted appearance is apt to give the whole work a very meretricious look.

Apart from this, some of Mr. Kareline's cabinet portraits are very fine, as I have said, both in arrangement and feeling; and it is a wonder that seldom or ever do we see anything in them like defective and imperfect sitting, which all the more presses upon me the conviction that they are very short in exposure. His finest cabinet portrait, I think, was the *Portrait of Mrs. Kistkoff* (No. 242). The ladylike character of this subject is beautifully worked out. The accessories in the picture are much quieter, and the never-failing mirror again successfully produces the lady in profile. If I might make a suggestion I would recommend Mr. Kareline to make a complete change in his ornaments and furniture; because, however varied they may be treated in arrangement, yet eventually these objects always cropping up will cease to charm and become very stale. I think there is nothing like the adaptation of accessories belonging to the individual who sits for his portrait, if we could only secure the use of them, but this is not always convenient.

I close by remarking that the lady's dress in this cabinet portrait is the most perfect development of a light dress which I have seen, and the tone of the picture throughout, I am certain, will not easily, if ever, be excelled in black and white.

Norman Macbeth, A.R.S.A.

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VIOLET GLASS FOR THE STUDIO.

As we anticipated, the claims of M. Scotellari regarding the superiority of violet glass in the studio are not being received in an unquestioning spirit.

Mr. Thomas Gaffield, whose name we have so frequently mentioned in connection with the colouration of glass, addresses to the *Philadelphia Photographer* some notes on the alleged advantages of this violet medium. He says:—

"To meet the idea expessed in my friend's (Mr. Stebbing's) letter in your December number, I promised in my last note to you to make an experiment upon the comparative action of the chemical rays of sunlight upon iodide and bromide of silver when transmitted through violet and colourless glass.

"I made the experiment with Mr. Marshall in his photographic rooms a few days ago, by placing a light shade of violet and a colourless glass side by side over a wet, sensitised plate, and then exposing it to light for about a second by pulling out the slide of the shield, and pushing it back again immediately. The result showed, just as I had expected, the fallacy of the claims of M. Scotellari. The plate under the colourless glass was darkened much more sensibly than the portion under the violet, thus proving the inferiority of the latter, which cut off a considerable proportion of the chemical rays.

"From all that I can learn from intelligent photographers and photographic journals it is a most surprising thing that in France, a country so advanced in scientific knowledge, any company of photographers could be found to give audience to the singular and oft-refuted claims made by M. Scotellari.

"It is undoubtedly true that violet or other coloured screens may be used with advantage in cutting off too much light, or in making an even diffusion of light upon the face of a sitter; but it can never be true, while two from six leave a less number than six, that the cutting off of a third or any fraction of the chemical rays of sunlight by violet glass in a screen or skylight can enable the photographer to obtain more rapid or effective results. The use of screens of various colours and in varying positions, according to the more or less favourable conditions of the weather or the location of the studio, is almost universal with good photographic artists, and we do not see any novelty in M. Scotellari's idea, or any peg to hang a patent upon."

Another writer in the same journal, "R. J. C.," also makes some remarks on the subject. He observes:—

"As this subject is now attracting some attention in Europe, and we of America are anxious to have the benefits of any improvements that may facilitate in any way the operations of photography, I have made a simple experiment in order to test the action of violet light on the iodo-bromide of silver. With a stereoscopic camera several trials were made on a winter landscape as follows:—A violet glass was placed in front of one lens, and a blue glass in front of the other, exposed twenty seconds. The end of the plate exposed to blue light flashed out first, and was somewhat overdone, while the violet end developed gradually, and came up about right. A second trial was made with the violet glass covering one lens, and the other uncovered; with the same exposure as before the end of the plate exposed to white light flashed out with great rapidity, and had attained its full development before the details of dark objects on the violet end began to make their appearance. A third trial was made with the blue glass covering one lens; the result of this was about the same difference as between the blue and violet, *i.e.*, the blue appeared to be as much slower than the white as the violet was slower than the blue. These experiments showed the correct time of exposure for each light to be about as follows, under the same conditions:—White light, ten seconds; blue light, fifteen seconds; violet light, twenty seconds.

"I have no reason to suppose that experiments under a skylight with white, blue, and violet glasses, each in turn, would result any differently, for blue glass has been tried to the entire satisfaction of nearly all the older American photographers, and it seems difficult to believe that any violet tint can be more actinic than blue, when the former must be produced by a mixture of red, the least actinic of all the colours. The experiments referred to above harmonise with this theory, as do also the very exhaustive experiments of Mr. Thomas Gaffield, as explained by him in the *Philadelphia Photographer* for October, 1876. He there demonstrates that blue is the most actinic of all the colours, while violet stands next, and yellow next to that. Red and blue in certain proportions make violet, and we find these colours in Mr. Gaffield's table, when combined, *i.e.*, a red and blue glass, stand next to the least actinic on the scale. Experiments, therefore, appear to agree with theory in placing violet light below that of blue in actinic power.

"This, however, is all contrary to the results claimed to have been secured by M. Scotellari, and substantiated by his 'skilful chemist,' M. Trat, which were that 'violet light acts much more rapidly than white or blue light, which diminishes about one-half the time of exposure.'

"Again: in giving his reasons for this method of lighting he says:—'The violet rays of the solar spectrum, having more than all others chemical properties, and being the rays containing the least caloric, I have conceived the idea of applying this tint to the glass of the studio.' This, in regard to the heat of the violet rays, does not quite agree with the experiments of Sir W. Herschell, who found the lowest temperature in the blue rays, which marked 56°, while the red, on the lower end of the spectrum, gave a temperature of 79°. This is in accordance with the theory of painters and colourists that blue is the coolest colour.

"However, M. Scotellari may have discovered a tint which possesses the peculiar quality he claims for it, and is really superior to white or blue in actinism; or may it be possible that violet light reflected from the sitter or objects lighted by it acquires properties not possessed by the same light when conveyed directly to the plate? Be this as it may, I would not advise any photographer to take out his white glass and put in violet until he has the advantages more satisfactorily demonstrated."

Until we know more of the subject we cordially endorse the advice given in the last sentence of the foregoing extract.

FOREIGN NOTES AND NEWS.

CONTRADICTION OF THE RECENT PARAGRAPH ON THE AUBELDRUCK PROCESS: SPECULATION ON THE SUBJECT IN THE *ARCHIV*.—A NEW PHOTOGRAPHIC SOCIETY.—ON THE CAUSE OF BUBBLES IN A DRAWN-OFF FILM.—HERR NORDEN ON THE PRODUCTION OF GOOD PRINTS FROM FAULTY CARBON TISSUE.—A HINT TO SHORT AND STOUT LADIES.

IN the current number of the *Monatsblätter* the editor says he is authorised by Herren Aubel and Kaiser to say that the paragraph professing to give an explanation of their process which has lately gone the rounds of the papers contains nothing in common with their invention. Herr Aubel showed him one of his printing plates, which are galvanically-stamped zinc plates, so that he might see for himself that it was not prepared in the way described in the offending notice. He is also able to state that the remark about Aubeldruck being only capable of reproducing lines, but not half-tones, is incorrect, and that this process could as easily reproduce a direct photagraph from nature as a lithograph or a copperplate. Further particulars are promised in the next number. Meanwhile we are just as we were—that is, perfectly ignorant of the *modus operandi* of this most mysterious of processes.

A correspondent of the *Archiv*, Herr Selinger, however, does his best to shed some light on the subject. He says:—"With reference to the paragraph on Aubeldruck, I may say that, as far as my experience goes, the process consists of an intensification with lead, which resists the action of fluoric acid fumes very well; and as soon as I have time I shall send further particulars as to the results of my experiments." Was there ever anything more tantalising?

From the same journal we learn that a Thüringian photographic society has just been founded at Gotha, with all the usual office-bearers, but no particulars are given as to the number of members or the objects of the society.

In reply to an inquiry about the cause of the small bubbles to be seen in the collodion film when a leather collodion is drawn off the glass with caoutchouc, and which make their appearance shortly after the coating, a correspondent of the *Archiv* replies that the only cause is the too high temperature of the "caoutchouced" plate. This temperature is exceedingly likely to be produced if the plate be dried in a drying-box or in the neighbourhood of an oven; and if the leather collodion be poured upon the still warm plate very slight degree of heat is sufficient to cause blisters, owing to the low boiling point of the ether. Blisters may, however, appear, he goes on to say, even when dried at an ordinary temperature, if the coating of caoutchouc be not sufficiently dried, as in this case the benzine fumes cause blisters in the collodion poured over it. To avoid this he recommends that after pouring on the thick solution of caoutchouc it should be allowed to drip and left to dry naturally, for several hours, or preferably all night.

In the same journal we have a continuation of Herr Norden's remarks on the production of perfect pictures from faulty carbon tissue, which we cannot do better than give at length:—"After it has been exposed I lay the paper under water, upon a washed and collodionised glass plate, in the following way:—I take the paper (which has dried very flat and smooth to the glass) and place it perpendicularly, the lower end of the picture lowermost in the water, and touching the bottom of the vessel. By continued pressure below I cause the paper to curve slightly, film outwards, and pressing at the same time from above and behind I bring the paper completely under the water, the film undermost. This *tour de main* must be performed very quietly and without hesitation.

"The tissue being under water I wait a few seconds; then, as the paper should not have begun to extend, I raise it at once upon the glass, apply the squeegee, and replace it immediately in cold water until I am ready to develope. I have left the pictures in the water in this state for several hours without observing that it produced either any advantage or disadvantage, in so far as regards the development. In any case it is indispensable, for the equality of the development, that they be left in the water at least ten or fifteen minutes in order that the carbon film may be perfectly saturated with water.

"As soon as saturation has taken place I lay the glass plate, with the adhering picture, in a dish, with rather warm water—say 35° or 40° R.—where the paper will be floated off the pigmented film in a few seconds. As soon as that has taken place I lay the glass with the pigmented film—with the film downwards, in order to prevent blisters—in what is called a developing dish, having a sloping bottom. I take the developing water, not above 23° R., and leave the pictures to develope in it naturally. The development ended, I rinse with warm water and again with cold. I then lay the glass with the developed picture for a few minutes in alum, then rinse again, and finally set the picture up to dry.

"With tissue which is but slightly troubled with the previously-mentioned faults (*i.e.*, reticulation and blisters) this treatment ought to secure faultless pictures. When the paper is very bad another manipulation is required; but the further trouble is richly rewarded by the brilliant and certain results.

"For this more faulty tissue the treatment remains the same until after the exposure. As soon as a sufficient quantity of carbon prints have been secured I proceed as follows:—I take the collodion which is used for coating waxed plates, dilute it four-fifths with alcohol, and pour this solution into a tin vessel, the size of which corresponds to that of the pictures. (The length of my box or vessel corresponds to the width of a cabinet picture. For larger pictures I have another plan, to which I shall probably come back later). I take the printed sheets of carbon tissue and draw them completely through the diluted collodion, and hang them up by clips and leave them to dry, which should take place in ten to fifteen minutes, according to the temperature. When dry the subsequent treatment is the same as that already described, and even with the worst sorts of carbon tissue there will be no faulty development.

"In the case of the last process the pictures may be retouched with common gum or albumen colour, as the fully-developed picture, when perfectly dry, must get a final coating of collodion. If this be omitted, in spite of the pigment film when on the glass being faultless, after it is transferred to paper the reticulation and gritty appearance will show themselves again unmercifully during the drying in full bloom, and all the previous care and labour will be lost.

"He who has not to struggle against small blisters or bubbles when transferring upon glass does not require to allow the paper to dry upon the glass after sensitising, but should simply press off the superfluous fluid to the right and left with a glass rod, and then hang the paper up to dry."

In exhibiting a large collection of combination prints (lichtdruck and lithography), amongst which were a number of fashion plates, Herr Max Jaffé gave a short account of the way in which the latter were prepared, which gives a little insight into the cause of the curious want of proportion between the size of the body and apparent length of the limbs usually shown by the figures in these plates, which are generally produced by a photochromotype process. The first thing to be done is to procure a pretty, graceful, and slender lady to serve as the original for the plate, or, rather, as an animated lay figure on which to hang the costume to be photographed. The next thing is to choose the tints of the costume so that the lights shall photograph white. A perfectly white dress would indeed give white lights, but, on the other hand, it would look hard; so Herr Jaffé recommends a yellowish grey, and as the present fashion is for thin figures, he recommends that the dresses should be made some four inches longer in the skirt than the model could actually wear them, and that, when being taken, she should be made to stand upon a footstool some four inches high, so that by this means she should appear tall and slender.

This, then, is the secret of the disproportionate figures one sees in fashion plates! On first reading Herr Jaffé's remarks we thought that he was recommending his ordinary lady customers who wished to pose for cabinet portraits to increase their apparent height by this artifice; and, wondering what object could be served by taking a portrait which must manifestly be unlike the original and, therefore, useless for showing to any one who had seen her, ws were induced to re-read the paragraph and see that Herr Jaffé had not taken sudden leave of his senses, but merely an advantage of a whim of that imperious ruler of photographers, Dame Fashion, by aiding her to promulgate her decrees.

But, to return to our photochromotypes. From the direct photographic negatives lichtdruck plates are prepared, which represent the models in brown and white, with the dress as white. As the same model may be used for various costumes of varying colours each pattern is drawn upon a lithographic stone, and then one after another is printed in ultramarine upon the lichtdruck. The same thing is done by means of lithography for the shadows and letterpress. To produce the colouring for the hair, face, &c., one must next calculate which would come cheapest—chromolithography or colouring with the brush. If a whole edition (6000 copies) be wished of the same lady, and with the same colouring, it would be most advantageous to do the colouring by means of glass or stone plates; but if, on the contrary, a great variety be wished, then the hand-colouring would be cheapest. Not many of our readers, however, are likely to be called upon to furnish negatives for fashion plates, so, except for any amusement they may afford, the foregoing directions will be lost upon them; but for ladies sending their photographs abroad, and who, unfortunately, are not fashionably slim and tall, the plan of lengthening their dresses and standing upon a stool to gain these *desiderata* may be useful. At anyrate we make a present of the idea to all those whom it may concern.

ON THINGS IN GENERAL.

THE Editors have very properly brought me to book for suggesting in my last that the Committee of the Edinburgh Photographic Society influenced in any way the award of the medals. I inadvertently wrote "Committee" for "Judges."

I am also called to account by a gentleman whose corns I seem to have trod upon *anent* my remarks on residues. He "has for over fifteen years sold to refiners at different places on the continent paper cuttings and residues," without their having "first ascertained their value." What an eloquent though speechless reproof is here given to the sordid materialism of the nineteenth-century man of business! You go to the refiner—a perfect stranger—and offer him what appears to be a mass of dirty paper and slate-coloured paint. You inform him that the paper contains precious metal, and that the mud is nearly pure silver. Not for a moment does he believe you capable of adding baryta to give weight to your paint, nor of passing off as a rich mine of silver and gold a heap of waste paper splashed over with your print-washing water; but he puts all in his scales, with deprecatory gestures at the possible suspicion of distrust that this act might suggest, and blandly hands over his thalers or his francs in return for that which the honesty which beams from your features assures him to be residues and clippings fat with rare stores of metallic wealth. Happy continentals! Depraved Englishmen! Perfidious Albion again!

It is no doubt a knowledge of this Arcadian innocence which has led Dr. Schnauss to propose utilising the residues from carbon work by recovering the metal from bichromate worth sevenpence a pound by means of acetate of lead at sixpence, and ammonia worth a few pence a pound, with the aid of tannin at five shillings. He should take it to the refiners and ask no questions. Then there would be the dirt from the bottom of his tank—certainly "useful for many purposes," he says. The chief use I can imagine it might have—contaminated as it would be with all sorts of "bits."—would consist in keeping his apprentices busy, and so on dull days preventing them from falling into the clutches of him who, as we are told, "finds some mischief still for idle hands to do." It was well known to the old alchemists that the searcher for the philosopher's stone required to come to his furnaces and alembics with a pure heart and mind. The grossness of succeeding ages proved too strong for the continuation of such a condition of mental and moral whiteness and the adepts have died out. Is it possible that "W. C. B's." experience points to a rehabilitation of such researches and the finding of the grand Arcanum itself?

The correspondents' corner has been very lively of late. I see one gentleman asks about Winchester quarts, and, incidentally, tells us Cooley reckons a tumblerful to be eight ounces. Surely this is from a very old edition, for, when "I take mine ease in mine inn," if they were to bring my "bitter" in an eight-ounce tumbler I should call for my bill and never more return. I even believe there is an act of parliament to prevent such intoxicating beverages being dispensed to a thirsty public in glasses other than of ten-ounce capacity. To return to the Winchester. Correspondents are right in complaining of vague terms for writing formulæ in; but I do not think a Winchester is often referred to when a solution has to be made with a uniform proportion of contents. Still, if they will guage the contents of their Winchesters in the correct way, I take it they will not find a great deviation from eighty ounces, *i.e.*, half-a-gallon; for these bottles should, of course, be measured as any others would be—up the *shoulder*. It will be found that from shoulder to neck as much as fifteen ounces may sometimes be put.

I perused with considerable interest Mr. Daniel's paper, read before the Bristol and West of England Amateur Photographic Association; but I should scarcely care for my experience to coincide with his as to tent work. "While erecting your tent place a saucer of water over a small spirit lamp; place your bottles to stand in it," and then take the lamp *inside.* I call this risky, to say the least of it, knowing the playful tendency of ether in the neighbourhood of a light; and to keep striking matches to re-light it every time you go in or out would be too great a bore.

For fear lest we get tired to death by M. Scotellari and his violet light, a gentleman in Blackpool interests us in the other end of the spectrum; he would have us believe that a room illuminated by yellow light would prevent the pitting in small-pox cases. Rather a nice look-out this, if our dark rooms are to be converted into sanitoriums for small-pox patients!

That art-culture among photographers is on the increase there is little doubt, if we may judge by the pictures one sees daily; but that every photographer does not possess the genius of an artist without preliminary culture would seem to be proved by the necessity an American background painter feels himself under to give some instructions in the use of backgrounds, from which I extract the following:—"Don't use artificial or real rocks with balustrades." "Don't put base-boards on landscapes or interior backgrounds." "Summer landscapes are hardly appropriate for ladies in furs," &c., &c. All very useful, but inferring the existence of plenty of room yet for general improvement in art knowledge.

Not the least remarkable amongst the month's events is the gradual assumption of a special tone by the licensees of M. Lambert. There have already appeared several letters from leading licensees showing a tendency to elevate themselves into a sort of sept which would exclude all who had not paid the magic thirty guineas. They affect an esoteric style of language, and altogether walk in very tall boots. They resent all attempts on the part of others to obtain similar results by unpatented means as an attack upon their prerogative, and an unprivileged intrusion into their penetralia. Hence we see poor "Alcestis" cannot make public the results of her clever manipulation, but one—no doubt a Lambertypist—rushes in with a howl, and practically accuses her of mendacity; but, fortunately, Mr. Spencer's letter tells exactly what he did do, and, strangely enough, almost uses the words employed by "Alcestis" in describing the appearance of his pictures:—"The same amount of gloss as that presented by an albumenised print." All I wish to say to the daughter of *Pelias* is—Continue in the same course and you will make a successful worker.

"Broomielaw" asks some questions about law and patent rights. My opinion is that if once we begin to enter into these matters of patent laws with regard to carbon, we shall stir up a very great deal of mud.

To turn to a clearer subject which has passed the period of probation, always shown in our art by the attacks upon its originality, &c., I mean the emulsion process, upon which a still newer light has been shed in Mr. Brooks's able and interesting paper recently read before the South London Photographic Society; it is, I consider, a very valuable contribution to our knowledge of this subject, and cannot fail to aid in rendering it more popular.

In speaking of the process I cannot help remarking on the singular opinion uttered by the Rev. F. F. Statham, F.G.S., as to the secresy with which emulsion workers invested their practice. Mr. J. T. Taylor very properly pointed out that such secresy did not exist, and, in fact, that workers almost vied with each other as to who should communicate the most intelligence.

The latest thing out is the new illumination for the studio—a lens five feet in diameter, to concentrate the light upon the sitter. It seems very straightforward upon paper, though the drawings are very remarkable altogether. I want to know how it is that a window of such a shape and size is pourtrayed, for I do not hesitate to say no face could be well illuminated for photography by such a window when placed in the position represented without the help of the new lens, while with it a due comparison is not afforded.

I am afraid the Editors are sarcastic, for they remark—"As we have not yet seen any specimens produced conformably with this mode of lighting we abstain at present from offering any comments upon the apparatus, or venturing any prediction as to the probability of its success."

FREE LANCE.

Our Editorial Table.

STREET LIFE IN LONDON. By J. THOMSON, F.R.G.S., AND ADOLPHE SMITH.

London: SAMPSON LOW AND CO.

FROM the temporary preface to this work—*temporary* because on the other side of the leaf it contains the contents of the succeeding number—we observe that it is the intention of the authors to portray the harder and less fashionable phases of London life, bringing to bear the precision of photography in illustration of their subject. The materials for these sketches of *Street Life in London* are to be selected in the highways and byways of our huge metropolis.

The first number contains three illustrations of this class. Of these, one, entitled *London Nomads*, represents a caravan of the class frequently met with on the less-frequented roadsides leading out of London; a second, designated *London Cabmen*, represents a hansom cab, whose driver is engaged in earnest conversation with a "chum"; while the third, *Covent Garden Flower Women*, represents three of these well-known vendors sitting or standing by their baskets of floral treasures.

Of the great interest attaching to a series of reliable illustrations of London life in its lower strata no doubt will be entertained. The illustrations are well printed, and the descriptive text very instructive.

DRY PLATES. By CHAMBERS AND CO.

WE have received from Messrs. Chambers and Co. samples of their uranium dry plates. When we last drew attention to these plates—their preparation at that time being in the hands of Colonel Stuart Wortley—we expressed the unqualified pleasure we had experienced in working with them. On trying the plates issued by Messrs. Chambers and Co. we find them in every respect equal to those which elicited our commendation at a former period; nor is this to be wondered at, for, as we are informed, the same method of preparation and the same formula employed at Rosslyn House are still adhered to in the Goswell-road establishment.

VIEWS IN ITALY. By HENRY G. ROGERS.

MR. ROGERS has followed in the footsteps of Mr. Woodbury, and, adapting the same *modus operandi*, has succeeded in achieving a degree of success that must be extremely gratifying. Situated as he is in the vicinity of scenes replete with natural beauty, Mr. Rogers has been enabled to bring a refined taste to bear upon the selection of such subjects as are more specially adapted for photographic representation, and hence, as a result, we have a charming series of views of "sunny Italy."

Meetings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

The annual meeting of this Society was held on Tuesday evening last, the 13th instant,—Mr. James Glaisher, F.R.S., President, in the chair.

After the reading of the minutes of the previous meeting the report of the Council was read and adopted. This was followed by the treasurer's statement, which showed a balance in favour of the Society of £412 6s. 11½d.

Mr. R. W. Thomas (the Treasurer) spoke of the causes of the falling off in the last exhibition. There was hardly an art exhibition in London whose returns were equal to those of the years immediately preceding. Even in the Royal Academy fewer pictures were sold than on previous occasions. At the time the exhibition was held there was much political excitement, and the columns of the newspapers were so crowded with matter of that kind that it was found almost impossible to obtain notices in them. No notices whatever of the exhibition had appeared in either *The Times* or the *Daily News*, and he, as Treasurer, was well aware of the influence of the daily press upon the attendance at the exhibition. Other causes of this partial failure were to be found in the exhibitions of Philadelphia and Edinburgh. The former was open at the same time and attracted many exhibitors, while many others had sent pictures to Edinburgh on account of the medals offered by that Society there, who would, doubtless, otherwise have sent them to London. He, however, took the pessimist view, and did not conclude that because the past year had been unsuccessful the forthcoming year would, therefore, be so likewise.

The Chairman desired to bear testimony to the devotion of Mr. Thomas to the interests of the Society. It was mainly to his efforts they were indebted for being enabled to meet in the hall in which they at that time were. He thanked him on behalf of the Society for the zeal and energy he had displayed while in office. He also eulogised and thanked the retiring Honorary Secretary, Mr. Friswell, who had filled a difficult situation with much ability.

After suitable responses had been made by the respective officers,

Captain Abney proposed that the Council should be empowered to award a silver medal to any investigator either at home or abroad, and quite irrespective of his being a member of the Society, who should carry out such investigations or make such discoveries as, in the opinion of the Council, should be likely to advance photography as an art or a science.

After an indication of practical details in connection with this proposal, and a few remarks on the subject by Messrs. Spiller, Sawyer, and York, it was agreed to.

Mr. H. B. Pritchard then read a paper on *Photography from a Holiday-Maker's Point of View*. This paper will probably appear in our next. Among the specimens exhibited by Mr. Pritchard were several of the original 5 × 4 size of plate, together with enlargements, apparently about sixteen or eighteen inches, produced from them.

Mr. Warnerke observed that it was not at all necessary that tourists should be able to develope their plates, as they might send them to be developed by those who had experience in that operation. In proof of this he exhibited a number of negatives taken in Egypt on his sensitive negative tissue, and sent to this country by post to be developed. The post mark on the package, which cost only twopence-halfpenny for postage, showed that it was posted in Cairo on the 2nd instant, and the negatives developed by himself upon this tissue were now before them.

The Chairman thanked Messrs. Pritchard and Warnerke for their communications.

The scrutineers then gave in their analysis of the voting-papers for the election of President and Council, the result being as follows:—*President:* James Glaisher, F.R.S.—*Vice-President:* Captain Abney, F.R.S.—*Treasurer:* John Spiller, F.C.S.—*Council:* Messrs. Francis Bedford, W. Bird, Jabez Hughes, W. Mayland, H. P. Robinson, J. T. Taylor, and R. W. Thomas. These were elected in room of those who annually retire by rotation.

The thanks of the Society were unanimously awarded to Mr. Glaisher for his efficient services as President during the past year.

Captain Abney exhibited a number of specimens showing the fugitive nature of certain aniline dyes; and, after some observations on this subject, it was announced that at the next meeting Mr. John Spiller would introduce the subject of the negative silver bath.

The meeting was then adjourned.

EDINBURGH PHOTOGRAPHIC SOCIETY.

An ordinary meeting of this Society was held in the Hall, 5, St. Andrew-square, on the evening of Wednesday, the 7th inst. There was a very large attendance, and the chair was occupied by Mr. John Lessels, President.

The minutes of the last ordinary meeting were read and approved, and the following gentlemen were admitted ordinary members:—Messrs. Edwin Smithells, David Gregg, Robert R. Raeburn, M. M. Scott, H. C. Peacock, G. B. Rodger, James Abbot, Archibald Downie, J. Adamson, Andrew Pringle, Andrew Dewar, P. S. Smith, J. Forrester, J. Simpson, W. H. Cunningham, and J. Forbes.

Mr. Norman Macbeth, A.R.S.A., one of the judges at the late exhibition, read a paper on *The Works of Kareline, and what may be Gathered from them.* [See page 76.]

Mr. J. G. Tunny congratulated Mr. Macbeth on the exceedingly interesting paper which had just been read. It showed that a very large amount of attention had been given to the works in question, and he (Mr. Tunny) thought them quite worthy of it. Kareline was a thorough master in his art, and well deserved the high recognition—the gold medal—he had secured. He could not, however, agree with Mr. Macbeth in his observations regarding art. True art was not a thing of paint and brushes, neither was photography an outcome of camera and lens. In both cases they were the mere tools, guided and directed by a trained and cultivated brain. A true artist, whether he used the one or the other, would put his mind into his work, and stamp it with his own individuality. With reference to the prize picture—which had already been the object of considerable discussion, and puzzled not a few as to how the effects had been produced—his opinion was different from that of Mr. Macbeth. He did not think it was taken in direct sunlight, as in that case the shadows would have been much deeper. The light, he thought, did not come through the window shown in the picture, but from a point above it, and both in front and behind the curtains. On the whole the picture was, in his opinion, not nearly so simple as Mr. Macbeth thought, and many of the lights had been put in. Some of the shadows, particularly those on the dress of the lady, were the result of sunning after printing. With a view to test his opinions on the subject he had, a day or two previously, from memory, tried to reproduce the composition and effects in his studio, which he had arranged for the purpose, and begged to submit the result for examination by the members. With him it was not a question of how a picture was produced, but what was the character of the production; and he had no hesitation in saying, after much careful study of the works in the late exhibition, that in his opinion Mr. Kareline stands unrivalled and alone.

Mr. W. T. Bashford also complimented Mr. Macbeth highly, and said that his paper was more valuable than anything he had ever read in connection with photography. Mr. Macbeth had not only pointed out the merits of the picture, but given the reason why it was to be admired. He had never seen so much useful information given in so small a compass. He agreed with Mr. Macbeth on the whole, and especially in his remark that photography was a representative art. But what would be represented was in the mind of the operator who arranged that which he desired. He hardly agreed with Mr. Macbeth in what might fairly be done over and above the simple work of the camera. Mr. Macbeth would leave there all defects that might exist, but that was really going too far. His opinion was that the photographer should aim at getting as perfect a photograph as possible, and then to use either the pencil or the brush, or both combined, wherever by such means the work could be aided or improved. He heartily thanked Mr. Macbeth for the lessons in composition, and the many lessons on other matters, he had given the members.

Mr. J. M. Turnbull said there was undoubted evidence of much work of both pencil and brush, as well as of shading, on the prize picture; but the works of the distinguished foreigner were no doubt very grand, and everybody might learn something from them.

Mr. W. H. Davies said the Society was much indebted to Mr. Macbeth for the great trouble taken, not on this occasion only, but frequently before, in educating the members. He heartily concurred in all that had been said in favour of Mr. Kareline's works, and suggested that the picture *Blind Man's Buff* would throw some light on how the prize picture, as well as many others equally puzzling, were produced. The window in the background of the *Blind Man's Buff* picture was the other side of the window in the prize picture; and he had no doubt that it was simply a "property" that might be placed wherever it was required.

Mr. A. Asher spoke highly in favour of Mr. Kareline's works, and took some credit to himself for having picked out his works in the Paris Exhibition of last year. On referring to his note-book he found that he had thought them the very best there. In his opinion the prize picture was an enlargement from a smaller negative.

Mr. R. H. Bow agreed with Mr. Macbeth in his admiration of Mr. Kareline's works, but not in the opinion that the prize picture was the best. The portrait of Mr. Kareline himself was, he conceived, finer. He thought also that Mr. Macbeth was wrong in condemning finish. An unskilful attempt to finish a photograph was doubtless objectionable, but, when skill and finish went together, there should be no limit to it.

Mr. T. Pringle believed the prize picture had been printed from two negatives, and that there had been much retouching and shading, but both were admirably managed.

Mr. J. Valentine (of Dundee) regretted that the distance from Edinburgh prevented his giving the exhibition as much attention as he would have liked. He could not understand why the gold medal had been given to the picture principally under discussion, and thought that many other works of the same artist were much better. He had no doubt that Mr. Kareline used reflectors very freely, especially in such compositions as that of the prize picture. Regarding the question of photography as an art, he would say into whatever work artistic feeling was brought that was an art; and it was well known that the feeling of the man could be, and was, brought into the work of the camera. Many years since he was able to pick out the works of Mr. Roger, of St. Andrews, from any number of pictures by other photographers, and that simply because there was a something belonging to the artist himself infused into every picture he produced.

Mr. **Macbeth**, in reply, said that he was sure no one would charge him with a desire to tread on anybody's toes; his only aim was to conscientiously do what was right. Photography was not really a representative art. It missed the cultivation of the eye in acquiring a correct notion of form and shape. It simply realised what was presented to it, and had no aim beyond realisation. Keeping that in view, however, he had no hesitation in saying that photography was a power in art, and he did not think any one at the present time would be found to defend the stupid, ignorant prejudice that some artists had at one time shown against photography.

Mr. G. A. **Panton** moved a hearty vote of thanks to Mr. Macbeth. [This was carried by acclamation.] He (Mr. Panton) said he had purchased the portrait of Mr. Kareline for the purpose of presenting it to the Society, which he then begged to do, and for which he received a hearty vote of thanks.

The **President** laid on the table a number of very fine large views by Mr. Valentine, of Dundee, which that gentleman wished to present to the members of the exhibition committee as a small acknowledgment of the pleasure he had derived from the result of their labours.

A vote of thanks was accorded to Mr. Valentine for his liberality, in acknowledging which,

Mr. **Valentine** said he should be glad at any time to present for the Society's album copies of such of his pictures as the members might feel specially interested in.

Dr. **Nicol** then directed the attention of the members to four frames of enamels, by Mr. A. L. Henderson, of London, which were intended for the recent exhibition, but which, through some mismanagement, had only reached Edinburgh that day.

Mr. **Macbeth** thought that the enamels really deserved some special remark. He did not think that anything could be better, and was extremely sorry they were not in time to be exhibited, as they were far superior to anything of the kind in the exhibition.

Mr. **Davies** had felt much disappointed at the non-arrival of Mr. Henderson's enamels, and even more so now that he had seen them. He was quite sure that had they been in time they would have been awarded the silver medal. He moved a vote of thanks to Mr. Henderson for sending them.

Mr. **Macbeth** quite agreed with Mr. Davies, and seconded the motion.

The **President** concurred in what had been said by both Mr. Macbeth and Mr. Davies, as there was nothing in the exhibition that could be compared with Mr. Henderson's enamels.

The Secretary laid on the table a number of circulars from the Photographers' Union of Amsterdam, announcing a photographic exhibition to be held there in September next, and a number of the members indicated an intention of putting forth their best efforts during the approaching season with a view to being exhibitors at the Amsterdam exhibition.

The meeting was then adjourned.

BRISTOL AND WEST OF ENGLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

The ordinary monthly meeting of this Association was held on Wednesday, the 7th instant, at the Museum and Library, Queen's Road, Bristol, —Mr. W. W. Stoddart, F.C.S., F.G.S., President, in the chair.

The minutes of the previous meeting having been read and confirmed, Dr. Thompson and Mr. Pusey (both of Bristol) were elected ordinary members.

The Chairman then read a communication entitled *Notes on Photographic Chemicals and their Adulteration*, which will appear in our next number; after which, a general discussion took place. The paper was fully illustrated by specimens and experiments.

The meeting terminated with a cordial vote of thanks to the President for his communication.

Correspondence.

EMULSIONS AND DEVELOPERS.

To the Editors.

Gentlemen,—In the last issue of The British Journal of Photography Mr. Herbert B. Berkeley gave an account of his very complicated mode of using bromide of zinc in the emulsion, and has come to the conclusion that "here is indeed a pickle for a simple photographer to get into!"

I have found in my rather extensive practice with this salt that it gives very excellent results, and is, moreover, very easy of manipulation. The salt is highly deliquescent and very soluble in alcohol. My method of proceeding is as follows:—Immediately upon procuring a fresh sample I carefully weigh it, and add so much alcohol to it that one minim shall contain one grain by weight of the substance. This can readily be accomplished, but some precaution must be taken against the too great elevation of temperature which is likely to arise, the heat evolved in the solution being very great, especially when operating upon considerable quantities.

The alcoholic solution keeps well, becoming slightly brown in colour, though it remains perfectly clear and transparent. This solution I add to the emulsion when required, and I am glad that I can thus avoid the use of water, which is necessary with salts insoluble in alcohol alone.

The samples of zinc bromide I can at present obtain in London require 0·699 grains to convert exactly one grain of the silver nitrate. If, therefore, fourteen grains of silver nitrate are to be converted into bromide, multiply 14 by 0·699, and the resulting number, 9·78, or about 9¾, is the quantity of zinc bromide required.—I am, yours, &c., L. Warnerke.

10, *Linden Grove, Peckham Rye,*
February 13, 1877.

LAST EXHIBITION OF THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

To the Editors.

Gentlemen,—While making every allowance to the retiring treasurer for having to perform the unpalatable duty of admitting that the late exhibition of the Photographic Society of Great Britain was a failure, I cannot help thinking that he ought to have been sufficiently ingenious to include among the reasons given for the failure the one thing which, more than all the rest, helped to bring about this unfortunate result, namely, the early date which was fixed for opening the exhibition.

Doubtless there were good reasons why this early date should have been chosen; but I beg to suggest that such an early date of opening may not again be fixed upon without the careful consideration of the Council, and that if it be decided that September is a better month for opening the exhibition than November, then that the photographic world be made acquainted with the decision at the earliest possible moment.—I am, yours, &c., Edward Viles.

London, February 14, 1877.

THE PROPOSED "PROGRESS" MEDAL.

To the Editors.

Gentlemen,—In the discussion on Tuesday evening on the subject of instituting a sort of "progress" medal for marked improvements in the science or art of photography I cited three instances which might possibly be taken as examples of what the Council intended to do. The instances I selected were the award of a medal to Herr Obernetter for his elaboration of the powder process in multiplying negatives, to Herren Eder and Tóth for their investigations upon nitrate of lead as an intensifier, and to M. Rousselon for his work connected with *photo-gravure*.

Mr. Warnerke met this statement by a direct contradiction, to the effect that medals were not given abroad for general progress but only for the solution of some problem definitely set forth beforehand. As the matter was one practically outside discussion at the moment I did not think it worth while to trouble the meeting with further remarks, but perhaps you will permit me to affirm once more what I said. No one is better aware than myself of the practice that existed at Vienna and at Paris to offer medals for the accomplishment of certain special work, and it is not three months ago that I myself urged Mr. Warnerke to claim an award offered for the production of a supple and transparent film by the Vienna Photographic Society. But the instances I took care to select differed from the above. No mention had been made by foreign societies of an intention to make an award for researches upon lead as an intensifier, or for a method of multiplication of negatives by the powder process, or for the special work which M. Rousselon has accomplished.—I am, yours, &c., H. Baden Pritchard.

General Photographic Establishment of the
War Department, Woolwich, February 14, 1877.

CARBON PRINTING.

To the Editors.

Gentlemen,—My sister "Nemesis" ought to *try* the carbon process instead of confining her attention to reading and writing about it. If she do so she will find that the anticipated difficulty of the collodion adhering to the glass exists only in her own imagination. Of course no one would for a moment think of using an *adhesive* collodion for this purpose, especially after the ample ventilation the subject has received; nor, I imagine, would one care to use collodion of any kind without giving the plate the preparatory whisk with a cloth sprinkled with powdered talc, as so often recommended by Mr. Woodbury and others. But even these preliminary precautions are only to be regarded in the light of luxuries rather than necessaries.

If I am to be met with the *dicta* of an old Autotype *Manual*, I reply by quoting the language and experience, more recently given, of a gentleman who was once a member of the Autotype Company, Mr. F. R. Window, and who, in an article on this very subject, contributed to the *Year Book* of your contemporary for 1875, expressly states that prints developed on washed collodion *could* be got off the glass without any "fatty body" being applied to the glass plate, and he was certainly not the sort of man to say "the thing that is not."

From all that has been published it appears, then, that Mr. Johnson, who used collodion for the purpose of sticking the carbon to the glass so that it *couldn't* come off, and Mr. Spencer, who used it so that, upon certain subsequent treatment, it *could* come off, and Mr. "Collodion," who used it in another way so that it *would* come off, all seem to be right from *their own* point of view, while they are doubtless all wrong from *the others*.

I suppose "Nemesis" or somebody else will rejoin that Mr. Window's paper was written after the patent of M. Lambert had been taken out. Well so it was after the *provisional* specification had been filed; but, as you very well know, provisional specifications cannot be seen by anybody, and the final one was not entered till April 20, 1875, while Mr. Window's article was published in January of that year.

The fact is, carbon printing as it now exists is *nobody's invention*, but has cropped up through the observations and experiments of a large number of people, who have each worked and improved upon what was known before; and who have all availed themselves of the principles given them by Mungo Ponton, Poitevin, and the Abbé Laborde. Strange to say there does not appear any record of these gentlemen having squabbled among themselves in the orthodox way.—I am, yours, &c.,

February 12, 1877. ALCESTIS.

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CARBON.

To the EDITORS.

GENTLEMEN,—A few weeks since a contemporary journal announced the opening of a carbon discussion, and in set—even if somewhat enigmatical—phrases gave the world to understand there was no more difficulty in getting and publishing the best and latest information on all details of carbon printing than on any other photographic subject. Those who wanted "to pick it up cheap" pricked their ears, and those—whose name is legion, for they are many—who had paid money to the company and M. Lambert, and failed to do anything, hoped their time was now coming.

Week after week we read and hoped in vain. To no purpose does a certain correspondent try to draw out a Lambert licensee who has been successful; and, after a number of absurd and ridiculous letters, containing not one syllable of information, it culminates in "Jo. Vestris," and this when the entire photographic world look on and beg for information. This is indeed being offered a stone when bread is sorely needed.

But how stands the matter of carbon? Let us see. A large number of the most skilled, successful, and enterprising men of our profession have paid to M. Lambert or the Autotype Company a great sum of money to have exclusive local rights, and to be taught to work the process. Ninety per cent. have failed to be able to work the Lambertype; this is admitted by the company, and is stated in one of their documents issued on the subject. Why is this? Because the thing is so trammelled with patent and other exclusive rights that no one will communicate to others what has cost him so dear. All have been made to look jealously on each other. Those very few who can work it keep most religiously to themselves this knowledge, and intend to do so. It is quite time to say publicly that it is perfect waste for any man to pay the company for a Lambertype license. The well-known Autotype brown tissue prints as good pictures as the special Lambertype.

Carbon does not require more skill than silver. It simply wants a clear, lucid explanation of certain mechanical arrangements and their *rationale*, and the supply of tissue free from any objectionable peculiarities. But the one thing, of all others, needed is to devise some scheme by which the theory, instead of being retained for the work of a few, should be thrown open to all. Next year the patent for making tissue expires, and with the closing of this monopoly we may look for competition, a reduction in price, and better quality. More solid colours are sadly wanted. The Lambertype purple is a poor, flashy tone; a good warm, rich, chestnut brown would be far better and more permanent.

That this can be produced is evident by the simple circumstance that the writer has had placed in his hands working samples of a tissue just the very thing, and herewith are enclosed specimens of it and of the resultant prints.

Lamentable, indeed, is the result of the patent monopoly in this carbon matter; and especially irritating is it to consider that by having granted special local rights during the terms of the various patents its use, instead of being thrown open to the world, is restricted to speculators.

My advice is buy the Autotype brown and the best transfer the company will sell you, take out no license, and practice away. Pay no regard to threats of law from local speculators.—I am, yours, &c.,

February 12, 1877. "AN OLD CARBONIST."

[In reply to the foregoing, we simply quote what was said by Mr. Samuel Fry, Mr. Jabez Hughes, and others at the January meeting of the Photographic Society of Great Britain. We have not yet received the specimens said to have been sent with this letter.—EDS.]

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PHOTOGRAPHIC ARTISTS' CO-OPERATIVE SUPPLY ASSOCIATION.—Under this heading we find the following in the last issue of the *Investors' Guardian*:—"This association proposes to apply the principles of co-operation to the business of manufacturers and dealers in all apparatus, articles, and appliances used in photography. It is also intended to purchase the goodwill, plant, and stock-in-trade of Messrs. Chambers and Co. and the Uranium Dry-Plate Company, and to carry on all business incidental to photography. The company was registered on the 5th inst., with a capital of £50,000 in £10 shares, the following being the first subscribers:—

	Shares.
Crewe Alston, 95, Belgrave-road	10
Harmer Steele, 4, New-square, Lincoln's-inn, barrister	5
Lieut.-Col. E. Ellerman, 141, Cambridge-street, S.W.	5
A. Brent, 37, Palace-grove, Bromley, Kent	1
E. Huntley, Richmond	2
F. Du Pre Thornton, 91, Victoria-street, Westminster	1
Walter M. Gee, 446, Strand	1

The number of directors is not to be less than three nor more than six; the first will be appointed by the subscribers, who act *ad interim*. Qualification, fifty shares. General meeting will determine remuneration. Capt. Herbert Kerr, of 251, Goswell-road, is appointed managing director at a salary of £600 per annum, or such larger amount as may be agreed upon at a general meeting."

PHOTOGRAPHY AND ARCHITECTURE.—In the course of a very able paper on *Architectural Illustrations*, by Mr. Maurice B. Adams, A.R.I.B.A., read before the Architectural Association last month, the author, after speaking of engraving and lithography, says:—"We now come to those processes founded upon photography, by which permanent impressions may be taken either in colour or printers' ink. Taking photolithography first as the most important for our purpose: it is based upon the well-known action of light in rendering gelatine and similar bodies under certain conditions insoluble, and this principle is the basis of the autotype, heliotype, and Woodbury processes, to which I shall presently refer. The first photolithograph published appeared in the *Building News* in 1868, from Mr. Street's drawing of St. Margaret's Convent, at East Grinstead, a copy of which is exhibited with several others. In most cases the subjects are reduced in size, but in other respects are exact *facsimiles;* and in order that you may compare the original with the photolithograph, Mr. Sharpe has lent one or two drawings only just now produced, and not yet published, with the lithographs taken from them. In making a drawing for reproduction by this process the most important point to be observed is, that there are no tones or half-tones in a photolithograph; everything about it is dead black and white, like those curious *silhouette* portraits by which one remembers the profile of our great grandfathers. The effect must be obtained entirely by the intermixture of white and black, the same as in a wood engraving. The work must be firmly and evenly drawn, in clear lines, with an uniformly black or brown shade of ink throughout. The best ink is Indian ink mixed with a little lampblack, to give a deadness of line. The paper should be as white as possible, with a hot-pressed surface. For pen-and-ink drawings there is nothing like common registration ink, on account of the bluish tone which it gives, and a satisfactory lithograph may be obtained from it if used freely and evenly, and of not too blue a shade. Brown ink reproduces very well when the work is executed in lines only, and not having the shadows washed in, as it were, with a lot of lines run together, as is generally the case in drawings of this nature; for then, instead of having a transparent shadow, similar to the original, the photolithograph will give a dead black or brown smudge, according to the ink used in printing. Pencil and chelk drawings do not permit of satisfactory reproduction by this process. I exhibit one example from Wickes' *Towers and Spires*. The object of the process is to obtain a transfer in lithographic ink, which transfer can be laid down upon an ordinary stone or zinc plate, and printed from in the usual way. The paper used is prepared with a solution of bichromate of potash and gelatine. The negative—opaque in the whites, and transparent in the blacks—is placed in a frame for printing, with a piece of sensitised paper close to it. The light passing through the transparent parts acts upon the paper, rendering them insoluble in warm water; therefore, when the prepared paper is placed therein, those parts not affected will wash away. Before it is washed the paper photograph is lightly coated with greasy ink, after which it is floated in warm water, face uppermost, the soluble parts being removed. It is then placed upon a sheet of glass, and, when washed and dried, is ready to be transferred to the stone. The remaining processes are all more or less similar to each other. The heliotype is analogous to photolithography, but is more comprehensive, and admits of gradations of light and tone, so that photographs from water-colour drawings or nature can be printed. The printing in this case is from hardened films of gelatine mixed with chrome alum, resembling horn. I have shown several specimens, and of the photo-tint, which is an improved form of heliography. The autotype is similar to the last; several inks being used for one impression, great skill is required in printing, which makes the process expensive. Sir Digby Wyatt's *Note Book in Spain*, and some of the plates in the *Keramic Art of Japan*, are from this process. The Woodbury process, up to a certain point, agrees with those already referred to; beyond that it is totally unlike either. Instead of printing from the gelatine films they are forced by hydraulic pressure into plates composed of lead and type metal, from which the impressions are then printed in gelatine ink or colour. The results obtained by the process are delicate and clear, resembling a photograph in every point, excepting, perhaps, the fugitive nature of the silver print, the Woodburytype prints being as permanent as printers' ink can make them. The cost of the impressions is rather more than those from the other kindred processes, and, like photographs, they require mounting, which, of course, not only adds to their expense, but their bulk for binding purposes. I have only to add that Mr. Woodbury is said to be continuing his experiments, with the idea of printing photographs in permanent colours, by combining his own process with the 'Stenochromatic,' to which I have already alluded. On the walls you will see examples of the aniline process of photographic printing. For a few copies of working drawings it is both suitable and economical, and can be recommended. It is only suited for the reproduction of boldly-drawn *black ink* tracings. Photography itself, of course, is an exceedingly important medium for the illustrations of architecture, not only for its own immediate productions, which for truthfulness and beauty must ever remain unsurpassed, but as a corrective against error in sketching, keeping the draughtsman up to the mark. Photography will never supersede sketching; indeed, it is not always possible to take interiors and details. Magnesium wire is sometimes used for this purpose; for instance, Mr. Parker obtained photographs of the Roman Catacombs in this manner. We have now touched upon all the more important processes applicable to the subject before us. All have their advantages as well as their objections. These I have endeavoured briefly to point out, while the examples exhibited enable you to make your own comparisons. In my opinion none is so suitable, all things considered, as photolithography."

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EXCHANGE COLUMN.

Wanted to exchange, for a first-class tent on wheels, a splendid telescope on solid brass stand, night and sun glass; value £10.—E. **Horrobine**, Morecambe.

For exchange, a dark tent, shuts to 24 × 18 × 3 inches, opens to 24 × 30 × 36 inches, for a rapid rectilinear lens, or offers.—Address, N. P. D., 7, Annette-road, Holloway, N.

A Dallmeyer's rapid rectilinear lens, six inches focus, will be given in exchange for a No. 1 triple achromatic lens by same maker, or a No. 5 new symmetrical lens by Ross.—Address, J. T. **Bainbridge**, Barnard Castle.

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ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

C. Magrave.—The pencil arrived safely. Thanks.

Practitioner.—Could you forward a sample of the emulsion?

R. P.—By cementing the lenses the rapidity of action will be increased.

R. R. B.—1. The fault lies in the plates.—2. We do not know the maker of the lens.

C. Oakeshot.—The effect is most singular. We shall have more to say on this subject soon.

Syntax.—Thanks. In our next. We have examined the new micro.-lantern front, and shall give an account of it soon.

B. Jones.—There is no novelty in the design or form of the condenser, but a different curve has been given to the surfaces.

Faber.—The green salt is the correct one. Let the strength be such that the effect will be produced in about half-a-minute.

J. S. Tulley.—One of the legal authorities named says that the opinion expressed by the "Peripatetic Photographer" is quite correct.

Erratum.—In the report of the last meeting of the Glasgow Photographic Association, published in last number, page 68, second column, tenth line from foot, for "cobbe" *read* "coffer."

A. A. Campell Swinton.—1. We have not yet tried the new toning bath.—2. Encaustic paste assists in preserving the picture.—3. The Lambertype process is one connected with enlarging.

G. P. B.—The effect on the lighter of the two prints is excellent; but the border of the oval one is too pronounced. The specification of the patent has not yet been published; when it is our readers will be made aware of it.

Quixote.—Allow the gelatine to absorb as much water as it can in two hours, and then liquefy it by heat. This will give a solution of the requisite strength. No special advantage arises from the use of bichromate of ammonia.

W. N. B.—1. We quite agree with you in your estimate of the lens by which you took the child's portrait.—2. Remove the lens from its cell, place it in warm water till the cement becomes soft, then clean the contact surfaces with ether, and apply a little new balsam.

Alex. Crawford.—There is no limit to the applications of photography; but, if there were, you must certainly be approaching pretty close to that limit by seeking to obtain photographs of the "finny tribe" when disporting in their native element. We do not, however, think it a very difficult matter to obtain a photograph of either a cod or a haddock, provided it is put into a small tank of water, the front of the tank being of plate glass. The tank must, of course, be placed in a good light; and a long-focus portrait lens should be the instrument by which your photographic angling is to be effected. An exposure of two or three seconds ought to suffice; but this will depend upon the lens, the diaphragm, and the light.

A. Hessey.—The American stereoscope, of which we spoke last week, possesses only simple lenses of the square or prismatic kind; but in constructing one of this class of stereoscope it would be rather easier to fit it with a pair of achromatic lenses. If modified in this manner it would form an instrument of great value and convenience.

Pylos.—1. A swing back is not necessary for such a small camera unless you are going to make a speciality of architectural work; and even then a swing *front* may be made to perform the part of an effective substitute.—2. For outdoor work we give the preference to the single lenses named by you, but should prefer them to be of rather a longer focus.—3. Both kinds of plate keep moderately well, and in respect of sensitiveness they are also on a footing of equality.

George Lee.—We join with you in your admiration of the beautiful rocky effects. But they are not "real rocks" after all, but only wooden boxes covered neatly and tastefully over with virgin cork. Several firms supply accessories and properties made of this kind of cork; and, when a few sprigs of any trailing creeper (also a purchasable article) are arranged or trained over such "rocks" a charming effect is produced.

A. F. T.—We are not prepared to say that the fumes of matches would be hurtful to a wet plate exposed to them only for a brief space of time; but we should be very sorry to allow highly-sensitive bromised plates to be placed in a position where they would be exposed to such emanations day after day. It was shown some time since that even the wood of which certain plate-boxes were made exercised a deleterious influence upon the plates.

S. L. L.—Some retouchers prefer to use pencils made by special manufacturers; but, although we do not possess any intimate knowledge of the art of retouching, we still believe we are correct in saying that *any* good pencil will answer the purpose. Read what has been written on this subject by those who are competent to act as advisers, among whom we award a high, if not the highest, place to Messrs. Burrows and Colton, from whose valuable treatise on *Retouching* you will derive all the information you require.

Frank.—There is no objection to baths made of gutta-percha, provided they are not to be employed for holding the negative nitrate of silver bath. When used for the latter purpose the silver extracts some organic compound from the gutta-percha, by which a most virulent kind of fogging of the negative is produced; and fogging from this cause seems more difficult of elimination than from any other. For fixing and washing purposes gutta-percha baths will answer quite as well as those of ebonite, while they are much cheaper; but for the silver bath we advise the use of ebonite, or even wood that has been saturated with a mixture of wax and paraffine. On your return from Japan we shall be glad to have the promised account of your adventures.

Thos. L. Way.—There are so many posing chairs in the market, and of such diverse forms, that it is exceedingly difficult for us to answer your question. On one principle we strongly insist: let the carved work of the chair not be such as to arrest the attention of the spectator to a degree that will make it in any sense a rival to the attractiveness of the sitter's face. In this respect the "eternal fitness of things" is quite disregarded by some photographers, who stick a poor simple-looking peasant, habited in his peasant's costume, bolt upright in a high-backed, elaborately-carved chair that would only be a fitting accessory in the portrait of a duchess of the mediæval period. Study the works of artists of taste and refinement before you decide upon a chair, and then select one of a quiet and unpretending design.

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The Photographic Society of Great Britain.—In giving the names of the council and officers of this Society in our last **Almanac** a mistake has arisen, the card containing the list for the year *previous* having been handed to the printer. This we now rectify and give a corrected list, which includes the names of the gentlemen elected on last Tuesday evening at the annual meeting:—*President:* James Glaisher, F.R.S.—*Vice-Presidents:* Captain Abney, F.R.S., V. Blanchard, Professor Stokes, F.R.S.—*Treasurer:* John Spiller.—*Council:* Messrs. F. Bedford, W. Bedford, W. S. Bird, J. H. Dallmeyer, T. S. Davis, Dr. Diamond, W. England, R. J. Friswell, S. Fry, Jabez Hughes, Lord Lindsay, W. Mayland, H. B. Pritchard, H. P. Robinson, G. W. Simpson, J. T. Taylor, R. W. Thomas, and Colonel Stuart Wortley.—*Assistant Secretary:* E. Cocking.

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METEOROLOGICAL REPORT,

Observations taken at 406, Strand, by J. H. **Steward**, Optician.

For the Week ending February 14, 1877.

These Observations are Taken at 8 a.m.

Feb.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks.
8	30·21	N	45	48	53	47	Dull
9	30·13	W	42	44	55	40	Cloudy
10	29·90	W	49	52	55	42	Dull
12	29·83	W	47	48	55	41	Raining
13	29·76	W	47	49	52	46	Dull
14	30·01	WNW	50	52	54	45	Cloudy

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 877. Vol. XXIV.—FEBRUARY 23, 1877.

ON THE ACTION OF BRONZE POWDER UPON SILVER PRINTS.

We received a few days ago from one of our correspondents a most remarkable specimen of the deleterious action of the bronze powder so commonly employed in the ornamentation of *carte* mounts upon the silver print, and showing most plainly the extreme danger which is incurred by those who persist, in spite of all the warnings which have been given, in using cards printed in "gold." The artistic appearance of the mounts got up in this manner will probably be urged as an excuse; but, we ask, is it judicious, is it *honest*, to supply prints which are doomed to speedy destruction merely for the sake of giving them a more attractive appearance when new? After all it is a matter of taste as to whether this style of ornament is really superior or even equal to others which might be selected. Personally we have a predilection in favour of a well-chosen colour impression, which has also the advantage of being perfectly safe.

The picture which has formed the text for this article consists of a *carte* which, by accident or design, has been mounted upon the reverse side of the mount, and consequently over and in contact with the name and address and ornamental border printed thereon in the obnoxious bronze. Our correspondent is unable to give the exact date when the print was mounted, but states that it was probably within the last few months. The result has been the development upon the print of an ornamental border corresponding with that upon the card, which gives a not unpleasant effect to the picture, though the latter is spoiled by the *facsimile* of the name and address, surmounted by the royal arms, which occupy the centre. In its present stage—for it is reasonable to suppose that the action is not yet complete—the altered portions present various grades of tint corresponding with the shades of the print, the delicate shadows of the face being entirely removed in contact with the design, while, in the deepest portions of the dress, which is of black velvet, the change is almost imperceptible. This may be accepted as evidence of the greater stability of vigorous prints as compared with weaker ones; though the fact that the change is perceptible in the deepest shadows leaves us no alternative but to suppose that it only requires time to produce a uniform fading irrespective of the depth of tint.

The picture under notice is an exceptionable case, for, of course, it is not to be supposed that photographers make a practice of mounting their prints upon the wrong side of the card, or that any design is usually printed upon the portion to be occupied by the photograph; but, such as it is, it offers a more than ordinary convenient opportunity of studying the phenomena. In ordinary practice the defect will be met with in the form of innumerable minute spots, which gradually develope themselves in course of time over the whole surface of the print. In the case under notice a careful examination reveals these spots in abundance, but they are, as yet, much less distinct than the design, owing to the feebler action of the almost microscopic particles which cause them. In order to make the matter clear to those of our readers who are not acquainted with the method of producing the so-called "gilt" lettering and designs, we may state that the impression is first of all produced by means of lithography; upon coming from the stone and before the ink has lost its adhesiveness the card is dusted over with the gilding material, or "bronze," as it is technically called, in the state of fine powder, the excess being wiped off with a tuft of cotton wool. In this manner the effect of a design printed in gold ink is secured. The powder employed—of which the composition will be given later—is in the form of very fine scales, and is of a peculiarly adherent character and "soapy" feel; it must be evident, therefore, that applied in the manner above described to the card and roughly polished off again innumerable minute scales—so minute as to be almost imperceptible without the aid of a magnifier—remain adherent to the mount and form the cause of considerable future annoyance, if not the entire ruin of the pictures placed upon the cards. The evil is further spread by packing the cards together with the printed side of one in contact with the surface of the other upon which the print is to be mounted.

Let us now turn to a consideration of the cause of the change effected by the bronze upon the silver forming the print. After what we have already said it is scarcely necessary to repeat that the gilt ornamentation is not produced by means of gold, which would be comparatively, if not wholly, innocuous. The actual composition of the bronze powder varies according to the colour required, and its preparation is frequently a very complicated operation. Thus, an old formula for the production of bronze for this and similar purposes consists of a mixture made by melting together, in certain proportions, verdigris, tutty powder (impure oxide of zinc), corrosive sublimate, nitre, and borax, the two latter probably acting as a sort of flux to bring the mixture more easily into a proper state of fusion. Another bronze in very general use consists of bisulphide of tin, which is obtained by raising to a red heat a mixture of metallic tin, mercury salammoniac, and flowers of sulphur. During the reaction sulphide of mercury and protochloride of tin are formed, and, together with a portion of the salammoniac, sublime, leaving the bisulphide of tin in the form of minute gold-coloured scales.

It is not difficult to understand that such substances as either of the above are capable of inducing a most mischievous action upon the silver print when allowed to remain in contact therewith for a lengthened period. What the precise action may be it is not, however, so easy to define. In the case of the first-mentioned it is very probable that the change is due to the direct action of chlorine, in the form of chloride of mercury or copper, or possibly both, assisted by other extraneous circumstances. In the case of bisulphide of tin, presuming that substance to be chemically what it is represented to be, there is little doubt that the result is due to sulphurisation of the silver print. Besides the sulphide of tin, a proto- and a sesquisulphide are known, the former of which is a dark grey powder, the latter a greyish yellow. It is probable that in contact with the silver image the bisulphide parts with a portion of its sulphur, which goes to the silver, the tin salt being reduced to the state of sesqui- or proto-sulphide. This action would, of course, be accelerated by the presence of moisture, by acidity of the mountant, or any similar inducing cause. But it is scarcely possible to suppose that the manufacturers of bronze powder for the use of painters or printers will exercise sufficient care in its preparation to ensure its being chemically pure; hence we may have a complication of evils in connection with so apparently simple a substance as bisulphide of tin. The only contaminations which appear likely to influence the result are the chlorides of mercury and tin, which may possibly be present in small quantity, and act by converting a portion of the silver of the image into double chloride of silver with mercury or tin.

So far we have supposed the effect to be produced by bronze powder *in contact* with the silver image; but in the picture we have before us, and in many cases where the defect has been complained of, it is evident that the action must have occurred *through* the paper supporting the picture, and without contact at all. In these instances we can only suppose the existence of a sort of galvanic action between the metal forming the photograph and that composing the bronze—the thin film of mountant, which is probably of a slightly hygroscopic character, serving as a conductor. Looking at the circumstances of the reaction, and the length of time required to bring it about, we think that the supposition of the existence of so feeble a current of galvanic force is not beyond the bounds of probability.

To return to the print itself: this has been carefully removed from the mount by soaking it for some time in lukewarm water in order to thoroughly soften the adhesive material, the final separation being effected in water as hot as the hand would comfortably bear. By these means the print was unmounted without disturbing the intervening film of mounting material or the layer of bronze forming the design, the print, as well as the card, upon drying showing distinctly the marks of the brush or sponge with which the paste was applied. An examination of the mount, when dry, demonstrated the fact that the bronze had undergone a change of colour—slight, it is true, but readily distinguishable. The colour is slightly darker in tint, while a portion of the metallic appearance of the surface has vanished, both of which effects might be expected to result from the reaction suggested above. One thing is worthy of notice: as we have stated, the streaks left by the brush or sponge with which the paste had been applied are plainly visible upon the surface of the dried mount and upon those portion which by their higher gloss show that they bear a greater thickness of the adhesive matter; the discolouration of the bronze is less than upon the other portions where a thinner film of matter has intervened between the bronze and the silver image.

We must confess our inability to suggest any better remedy for the evils arising from the use of mounts printed in "gold" than their total banishment from the studio and album. For it must be borne in mind that the disease does not confine itself to the works of those only who use the obnoxious mounts, as the introduction of a single *carte* so mounted is liable to spread it, like a sort of epidemic, amongst the contents of a whole album, especially if the pictures be liable to much handling. It appears scarcely fair to others that their work should be thus laid open to the charge of careless manipulation. It is not as if this style of mount were the only one suitable to the purpose. If such were the case it might be some excuse for clinging to bronze in spite of its danger; but as matters are we say emphatically—let it be banished.

NEW EXPEDIENTS FOR SECURING UNDISTORTED ARCHITECTURAL PHOTOGRAPHS.

When Mr. M. Noton makes any suggestions bearing on that important department of photography usually designated "mechanical" we all read them with much attention; for we know that while that gentleman possesses a fortunate faculty of invention his suggestions are characterised not less by originality than practical utility. In the transactions of the Manchester Photographic Society, recorded in another page, it will be seen that Mr. Noton has introduced a ball-and-socket lens mount for a camera front. This points to a subject on which we have more than once written, but on which there still exists a good deal of misunderstanding.

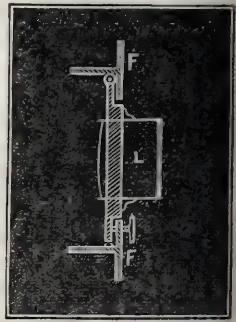
We shall not at present say anything regarding the value of a swing back in a camera, nor institute any comparison between the swing back and swing front, beyond this—which we do for the sake of the younger readers of this Journal—that a swing back was appreciated at a very early stage in the history of our art-science as a means for obtaining photographs of buildings which should be free from distortion of an offensive character, invariably produced when the sensitive plate deviates from a perfect perpendicular position. It was subsequently found that a swing front to the camera acted quite as well as a swing back, although its use was attended with more discomfort; and various devices for "swinging" the front—or, to speak more strictly, for placing the axis of the lens at other than a right angle to the plate—have already been described in these pages at various times during the past sixteen years.

All this being premised, we now resume the consideration of this subject, which acquires interest from the fact that this is the period when photographers are beginning to bestow consideration on the apparatus they are to employ during the approaching season, and we are made aware that this special feature is anxiously considered by the numerous letters we receive in which allusions frequently occur as to the necessity of, or substitutes for, swing backs, and about which inquiries are made.

Let us commence by reiterating an assertion long since made that the best method of effecting the parallelism of the sensitive plate is by having a swing back to the camera. While we state that this is the *best* method we desire not to be misunderstood. It is best because most convenient and readiest. If we could always obtain a camera having a swing back we never should have recourse to one having either a swing front or a swinging lens. The proportion of cameras in constant use in which the back is quite rigid is very large; and to have these altered and reconstructed with a special view to architectural requirements is quite out of the question. To suit such cameras the swing front has been introduced. Equally perfect when adjusted, it is much more troublesome to adjust properly, and this is the very worst that can be said against the system.

We now come to consider the nature of some appliances which act as substitutes for the swing back that have not hitherto been described; and we here confine ourselves to an ingenious system adopted by Mr. W. B. Woodbury, and which we exhibited, without describing it, in 1875, at the technical exhibition of the South London Photographic Society held during that year. We shall now give such a description as will enable its parts to be thoroughly understood.

Screwed to the camera is a flange, into which fits with a smooth degree of tightness, yet capable of rotating, a second flange, at one edge of which is hinged the flange proper, namely, that containing the screw into which the lens is fixed. It is with the mutual relations of the last two flanges we have now to do more particularly.



The annexed diagram shows the form and relation of these two flanges. F represents the outer of the two, the lens L being screwed into the inner one, which is hinged at the upper edge. It will be seen that there is no chance of light gaining access to the camera, as the broad ledges of the flanges quite prevent that. A spring, not shown in the diagram, keeps the smaller flange firmly pressed against the larger one, and when these two are thus together the lens is then axially accurate with regard to the sensitive plate; that is to say, the one is at a right angle to the other. But let us suppose that a deviation from the rectangular relationship of the two is desired. All that is required to effect this is the turning of a milled-headed screw, shown in the diagram, by which the inner flange is forced back from the outer one at one side only, the hinge retaining it in position at the opposite margin. From this it will be seen that a certain amount of obliquity is imparted to the lens by simply turning the thumb-screw.

But, it may be objected, this will only "swing" or tilt the lens in one direction. This is not so; we have already said that screwed upon the camera front is a flange into which the larger of the two here shown fits with a degree of tightness capable of rotating easily. In this is placed the whole arrangement shown in the diagram, and when once the lens is placed on the slant it may be directed upwards or downwards, to one side or to the other, by the mere rotation of the flange.

Whether this or the elegant ball-and-socket system described by Mr. Noton be adopted, one thing must be observed: when a building is about to be photographed the camera must first of all be placed perfectly level, the greatest care being taken that *it* be not tilted. Next, the lens must be turned or tilted upwards (we assume that the building is a lofty one) in the direction of the upper portion of the structure; it must then, by means of a rising front, be slidden upwards to the top of the camera until the whole of the building is properly included. But to whatever height it be necessary to elevate the lens with the camera front, attention must be paid to this—that the lens shall be tilted in its setting or flange to only such a degree that its axis shall be directed towards the centre of the ground glass. If this be attended to architectural views obtained in this way will be quite as free from the distortion of convergence as if a camera with a properly-constructed swing back were in use.

We need only further observe at present that by means of the swing lens system described now or on a former occasion the details in the foreground of a landscape may be taken quite as easily as by a swing back, but the course to be adopted must be the reverse of that here prescribed. In all cases, when the rectangularity of the lens and sensitive plate are deviated from, a smaller stop must be used with the lens than when an ordinary picture is taken, and this applies to both systems—the swing back as well as the swing front.

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The reading of Mr. H. Baden Pritchard's paper on *Photography from a Holiday-Maker's Point of View*, at the last meeting of the Photographic Society of Great Britain, reopens the question of the production of transparencies direct in the camera for the purpose of subsequent enlargement, and reminds us that from time to time complaints are heard from various quarters of certain difficulties which are experienced in connection with the method. There is not the least doubt that for the purpose mentioned—especially where the original *cliché* is so small as to be of no use except for enlargement—the production of a transparency direct is not only very convenient, but is actually better than securing the picture in the ordinary negative form, doing away, as it does, with the necessity of making the transparency by a separate operation, with its concomitant defects of loss of sharpness and the risk of increasing the structural character of the image. It is, of course, possible from one of the small negatives to reproduce an enlarged one direct by the same means; but for obvious reasons it is preferable to perform the transformation upon the smaller size—firstly, in order to avoid the risk attending the operation of redeveloping upon a large plate, the tender film remaining after treatment with nitric acid; and, secondly, because the delicate image resulting from this course is much more suitable for enlarging purposes than for direct printing. We cannot but think that, were the difficulties thoroughly removed, the transparency method would be generally adopted by those who work with the pocket camera and small plates; and the following hints may assist in bringing about that desirable end. The following may be enumerated as the difficulties most generally mentioned:—Want of density in the redeveloped image; inability to retain the film upon the plate; want of half-tone, the finer tints being rendered of a nearly uniform shade; and splitting of the film, upon drying, after development. With regard to the first, unless certain precautions be adopted, it is almost impossible to obtain anything but a very feeble image, owing, as it is supposed by many, to the removal of the organic element from the film by the acid. This, however, is not altogether the case, but is partially due to the action of traces of acid left in the film, which, if treated with weak alkali previous to its second exposure, proves capable of giving more than the necessary density for enlarging. An alkaline solution of tannin forms a very good intermediate wash, or, better still, the one to be described in connection with the next difficulty. The slipping of the film gives much less trouble, as we have noticed above, upon small than on large plates; and the inconvenience may be reduced to a minimum by flooding the plate with dilute albumen previous to re-exposure. A solution composed of albumen, one ounce; water, six ounces; and a few drops of ammonia, will be found to combine the remedies for this as well as the want of density, and adds, moreover, to the delicacy of the deposit. The next defect—want of half-tone—arises from improper development in the first stage. Familiarity with the requirements of ordinary negative work leads the operator in this case to keep the plate as clean and brilliant as possible; but it must be borne in mind that every glimpse of unchanged bromide in the negative means so much fog or, rather, veil in the transparency. It is necessary, therefore, to push the development further than is usual; but this should be done rather by using a stronger dose of ammonia than by the prolonged action of a restrained solution, which would tend to hardness. The picture should be clearly visible in all its details upon the reverse side of the glass, whilst the surface of the film should be slightly veiled, except in those portions which require to be absolutely opaque. Splitting of the film upon drying is prevented by a wash of dilute albumen, which may or may not contain a trace of ammonia. If attention be given to these points success will be tolerably certain to follow.

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"VISION PURPLE."

I have recently been most deeply interested in learning some very remarkable discoveries by a continental *savant* in connection with a subject which especially attaches itself to the photographer—the structure of the eye. To myself its study has always been surrounded with such manifold attractions that I cannot help thinking a brief account of the new discoveries will be of sufficient interest to justify my attempting to bring before the readers of this Journal a short description of these recent important additions to our knowledge.

For a moment we may glance at the optical construction of an eye, which will render more easy the comprehension of the newer part of the subject—the human eye being taken for the purpose. The eyeball, an almost globular object, not at all the shape it appears through one's eyelids, may be considered as a lens and camera in one—the lens a cemented triplet with its focus on the posterior inner surface, and possessing a self-acting diaphragm and focussing arrangement. The diaphragm is the iris, and it accommodates itself to the varying illumination of the object which is viewed. It is a variously-coloured, thin, nearly flat ring of muscular tissue, the inner edge of which lies against the anterior surface of the inner lens of the compound, which is known as the crystalline lens. The focussing is all carried on by varying the form of the crystalline lens, which has the power of involuntarily assuming a shape of greater or less convexity. It is not uniform in density, the inner part being more dense than the outer, and yet the power of focussing is most complete and the definition in the centre of the field excellent. The triplet is blackened inside to avoid reflections, the black wall being known as the choroid coat, upon which and immediately contiguous to the back lens, and in contact with its containing membrane, lies what may be likened to ground glass or sensitive plate—the retina, a thin, delicate, nervous membrane, from $\frac{1}{80}$ to $\frac{1}{150}$ inch thick, which is the first medium of communication between the brain and the triplet lens.

When the eye is pointed to an object this latter is depicted on the retina just as in the ground glass of the camera, and the sensation is conveyed through the optic nerve to the brain. The optic nerve may be called a bunch of microscopically-fine fibres, which arrive at and enter the back of the eye, so enclosed in a sheath as to form a thick cord. It then splits up or ravels, and all the fine ends disperse themselves in a delicate network all over the back of the eye, each one ending in, or being in connection with, peculiar structures, named "rods and cones," the extremities of which alone are capable of being acted upon by light.

It will be remembered that a few years ago much amusement was caused for photographers and other scientific men by the announcement that an exact photographic picture of the place of its death had been discovered imprinted on the retina of the eye of a slaughtered animal. Much fine writing was expended on the *canard*, which was universally swallowed; it was long before it was all shown to be pure fiction. But since that time continual researches have been made, and now the decision is reversed, and the great *canard* reappears in another dress, shorn of its extravagance, but still showing its original outline conspicuously.

Very reecently it has been discovered that the layer of the retina, the rods and cones, is always coloured in living animals with a more or less deep purple pigment (this is quite a separate arrangement from the dark coat of the choroid). The peculiarity of this pigment is that light destroys it, and it also disappears directly after the death of the animal. According to Boll, however, the colour destroyed by light is almost instantaneously restored by taking it into a dark room. This wonderful, sensitive purple, according to the latest investigations by Kühne, persists after death if the retina be not exposed to light, and the bleaching by gaslight is so slow that the progress of fading can be watched without any extra (mechanical or optical) help whatever. With a sodium flame giving a perfectly non-actinic light, all operations of dissection and separation can be performed without change occuring. The "vision-purple," as the discoverer has called this new matter, may be dried on a glass plate without alteration. It is not destroyed by ammonia, glycerine, or common salt, while, *per contra*, alcohol, acetic acid, caustic soda, or a temperature of 100 degrees C. destroys it.

Kühne also found that it was acted upon by the rays of the spectrum in just the same manner as silver—that is, the greatest action at the most refrangible end. He found that a retina removed from the eye of a frog exposed to light simultaneously with a mere section of the eye, leaving the retina in its place, behaved quite differently; the separated retina *lost* its colour, the other only *changed.* These observations suggested the theory that the eye had a sort of recuperative action on the "vision-purple" when in contact with it, and it was proved by the following experiment:—An eye was cut in two, a portion of the retina removed from its support, and the whole exposed to light; the flap lost its colour, the adherent part was unchanged, *but upon replacing the bleached flap the colour all came back.* Last month, after working on these lines, Kühne was able to announce that he had been able to obtain actual images on the retina, which corresponded with objects that had been looked at during life. He had gradually been arriving at the belief that there might be some truth in the stories of images of things seen immediately preceding death being impressed on the eye; but the difficulty was that the length of time the light would need to act in order to produce a picture would be so long as to destroy the balance of power to restore possessed by the epithelium of the retina,

His final experiment was to take a living rabbit, and fix its head and one of its eyeballs at about a metre and a-half from an opening thirty centimetres square in a window-shutter. The head was exposed for three minutes to a somewhat clouded midday sky, after first being covered over for five minutes with a black cloth. The animal was then immediately decapitated, the eyeball which had been exposed to the hole in the shutter instantly extirpated by the aid of yellow light, then opened and at once plunged into a five-per-cent. solution of alum. Two minutes after death the second eyeball was similarly treated. On the following morning the milk-white, toughened retina of both eyes were carefully isolated, separated from the optic nerve, and turned. They then *exhibited, on a beautiful rose-red ground, a nearly square, sharp image, with sharply-defined edges;* the image in the first eye was somewhat roseate in hue and less sharply defined than in the second, which was perfectly white. The experiment was witnessed, among others, by Professor Bunsen.

Dr. Gamgee, from whose paper I make these extracts, states that he has repeated most of the experiments, and can confirm their accuracy. He says that the purple-red colour of the frog's retina, and its subsequent decolorisation, may be most satisfactorily demonstrated in ordinary daylight.

It will be noticed that the majority of these experiments are made upon living subjects (doubtless rendered insensible to pain), so that it will of course be out of my readers' power to repeat them; but, to those who are sufficiently interested in the subject of the optical conformation of the eye, a great amount of instruction will be obtained by dissecting a freshly-killed ox's eye, which bears a great resemblance to the human eye. In my earlier experiments in dissections I found it impossible to satisfactorily cut through the sclerotic (*i.e.*, the external white part) till I learnt to tie a piece of lead to the outer cord of the optic nerve, sink the eye under water, and then dissect. G. WATMOUGH WEBSTER, F.C.S.

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THE DUSTING-ON PROCESS.

[A communication to the West Riding of Yorkshire Photographic Society.

THE dusting-on process is one of the many useful and available processes which have, unfortunately, received but little attention at the hands of photographers in general. A process which combines, as it does, facility of production with scope for the introduction of artistic embellishments, either in the finished picture or on the negative for printing purposes, is certainly worthy of attention.

Its artistic value is at once apparent when I state that the effect to be produced in the picture is almost entirely under the control of the operator. Some portions of the picture may, if desired, be left with the smallest trace of colouring matter, and others may be developed to absolute blackness or perfect opacity.

In making pictures on opal the vignetting may be carried out in any manner desired, and many most artistic effects may be readily produced. A skilled operator may regulate the light and shade, or balance of the picture, in the same manner that an artist does for the purpose of sinking any portion of the figure, or enhancing its value by contrast, with the advantage that, however he may manipulate, he cannot well destroy the likeness.

It is well known that the artistic value of a picture depends, to a large extent, upon the treatment of the background, which must be subordinate and still tend to give relief to the figure. A badly-managed, monotonous background, devoid of light and shade or gradation, will certainly detract from any merit the picture may otherwise possess. The reply given by Rubens to a person who recommended his son to him as a pupil, by saying he was sufficiently advanced so as to be able to paint his backgrounds, will never be forgotten—"If he can, my good friend, he stands in no need of my instruction." So well did the great artist recognise how much painting was dependent upon that feature for its excellence.*

The various ways in which this process may be utilised are very numerous. In the early period of its existence it was principally used for the purpose of producing photo-enamels; but it is now used in various ways—for the production of negatives for printing or reversed for carbon printing by single transfer, for the production of opalotypes, the intensification of negatives, either as a whole or locally, as in the production of skies and atmosphere, or even to the extent of introducing figures in suitable places. But these manipulations require the assistance of an eye capable of judging of the best effect, and that most in keeping with the subject.

The process is based upon the decomposition of organic matter in conjunction with a chrome salt—not by utilising directly the products of the decomposition, but by a resultant action, consequent upon exposure to light. The action is analogous to that upon which carbon printing, photolithography, &c., are based, viz., that bichromated organic matter, in its normal condition—that is, unacted on by light—is absorbent of water and soluble, but by being exposed to light becomes non-absorbent and insoluble. Thus, if we take some organic substance of a deliquescent or hygroscopic nature, sensitise it with a chrome salt, and expose to light, it follows that such exposure will destroy its power of absorbing moisture; but suppose you expose only one half and keep the other screened the protected portion will retain its absorbent powers. Of this peculiar action the dusting-on process takes advantage.

It will be seen that the exposed surface will be more or less absorbent of moisture inversely as the ratio of its exposure. The parts that have been exposed to strong light through the transparent portions of the *cliché* will be insoluble; the portions covered by the dense parts will remain in their original condition, while the parts exposed to the intermediate tones will be more or less "tacky," according to the relative density of the *cliché* in those parts. If a powder in a fine state of division be brushed over a plate thus prepared and exposed, it will adhere to the surface according to the light and shade of the original. Thus a negative will produce a negative, and a transparency a positive.

There are a number of formulæ published for the preparation of the sensitive mixture, of which I have tried several, but find I can work best with the one published by Geymet, as follows:—

Water	17	ounces.
Glucose	1½	ounce.
Honey	3	drachms.
Gum arabic	6	„
Bichromate of ammonia Saturated solution	3¾	ounces.

The proportion of deliquescent substance may be varied with advantage according to the season, a greater portion being required in summer than in winter, when the atmosphere is often loaded with moisture. A very useful suggestion on this matter will be found in an article in the ALMANAC for the current year, by A. Cowan, under the title of *A Drop of Moisture on a Dry Subject,* in which the writer recommends the use of a hygrometer for ascertaining the amount of moisture in the atmosphere. The less moisture present the greater the difference between the readings of the two thermometers, and, consequently, more of the hygrometric compound is required. According to Geymet a larger proportion of bichromate of ammonia produces increased density; a diminution induces a greyness all over the picture.

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* Burnet.

Unless you are prepared to do a quantity of work straight away it is better to make up the compound without the sensitiser and add the bichromate as required, as the mixture will not keep for any length of time. After mixing filter very carefully, as any sediment or dirt is fatal to perfection in the picture, every particle of solid matter forming a black spot, which, if it happen to come in the light of your picture, is rather objectionable.

The glass having been prepared by immersion in nitric acid, washed, and allowed to dry, is coated with the sensitive mixture. It is better not to polish the plate, but simply, if you are satisfied as to its cleanliness, to warm slightly, brush off the dust, and coat. Here it is probable you will feel called upon to utter a few strong expressions, as the solution will doubtless refuse to run on the plate, and most likely, unless you are careful, you will succeed in sensitising your cuffs or shirt sleeves; but with care you will be able to coat a plate by directing the erratic course of the solution with the finger. It will sometimes occur, during drying, that the solution will suddenly leave some portion of the plate, in which case a gentle rubbing with the finger will generally suffice to make it flow. After coating the plate return the surplus solution to a second bottle, so as to keep the original solution free from dust. The plate may be dried with a gentle heat over a Bunsen burner or a spirit lamp—the latter, perhaps, being preferable.

When the film has dried quite hard and glossy it is ready for printing upon. Warm the negative or transparency which you are going to reproduce, and place the sensitive plate in contact. Expose in a pressure-frame. The frames constructed for printing pictures upon opal are very suitable. The time of exposure varies considerably, according to the nature of the light and the quality of the negative—from a few seconds in direct sunlight to twenty or thirty minutes in a weak light. A *cliché* violent in contrast will suffice with a shorter exposure, while with a very soft negative the exposure will need to be longer, as, contrary to ordinary printing, the longer the exposure, within certain limits, the more vigorous the result.

The plate having been exposed, take it into a room having a yellow light, but as much light as you can get, as it is necessary to watch well the development. In taking the sensitive plate from the frame the picture will be faintly visible; if you have been printing from a transparency the image will be of a negative character, and *vice versâ*.

At this stage the plate will be found slightly "tacky" from the moisture absorbed during the exposure, which must be driven off before commencing to apply the powder. Were the powder applied to the plate when in this condition the result would be a most unsightly patch of colours which could not be remedied.

Warm the plate again, and when dry—which may be ascertained by touching the margin of the plate with the finger—lay it on a piece of white paper so that you may watch its progress, and brush over it the powder, which must be perfectly dry, with a tolerably large soft brush. Cover the plate evenly with a few rapid motions of the brush, which, if the exposure has been correctly timed, will develope a faint image of the picture. Continue the development with a circular movement of the brush until the requisite density has been obtained. If the development appear to stop before it is sufficiently out brush off the surplus powder, and allow the plate to stand for a minute or two to admit of its taking up a little moisture from the air, and proceed again as before. It is possible that this may have to be done several times before the picture is sufficiently developed. Should the exposure have been too long the picture will not develope well, and will refuse to take the colour except in the deepest shadows. On the contrary, should the exposure have been too short the picture will develope all over, and have a grey, flat appearance, like a print from a much over-exposed negative.

It is probable that the first few plates may not be altogether successful; but by a careful noting of defects the operator will be enabled, with a little patience, to produce good results.

After development comes the most critical period, and one requiring great care and delicacy of manipulation, viz., the fixing. Several methods have been given, but the method I have found most satisfactory is by flooding the plate with alcohol, and then allowing it to dry spontaneously. Now immerse in a weak solution of alum until the yellowness disappears, and place for a short time in clear water, dry, and then varnish as usual if a negative, but if a positive, to be coloured upon, use matt varnish.

This process is, perhaps, most useful for the purpose of reproducing negatives, as the quality can be varied and improved. A vigorous negative may be produced from a thin one, and a soft, thin negative from one possessing too much contrast. The process is well worthy of a trial, as there are so many ways in which a power of this kind is useful to a photographer; for instance, when a large number of prints are required, and there is only one available negative, this method enables the photographer to reproduce the negative quite equal to the original, and, if necessary, even to improve it.

J. Crosthwaite.

ÆSTHETICS OF PHOTOGRAPHY.

The critical notice of Mr. Kareline's works and probable mode of working, which was communicated to the Edinburgh Photographic Society on the evening of the 13th instant, and printed in your last issue, is well worth a most careful perusal, both on account of its merits and the high standing of its author in the art-world. But by one who has not had the privilege of seeing the works of the now-celebrated Russian photographer, Mr. Norman Macbeth's able and thoughtful remarks on them can only be read as descriptive information, very full of suggestion and interest. Not so, however, the other parts of his communication, which relate to the claims of photography as a fine art; these have a general bearing, and are fairly open to discussion.

While dealing with the photographs of Mr. Kareline as results of art in the highest sense of the word, Mr. Macbeth still does not allow photography to be anything more than "an auxiliary of art," because, as he alleges, it is not "representative," but only "the most positively realistic manifestation of a pure reflection," which, in the case of portraiture, is particularly to be valued when the sitter is dead. Why? (We need not search far for the latent motive of this thought.) Because, perhaps, posthumous portraits could be painted, or marble busts executed, by the help of this "realistic manifestation," and so prove that photography is literally the "auxiliary of art."

Painting and sculpture can very well afford to pay our art this humble meed of praise; but has photography no higher function than that of being the humble—often the unacknowledged—servant of these two noble arts? I venture to think it has, and, moreover, that it may justly aspire to recognition as an æsthetic art, though less honourable than they, because more limited in its sphere.

That photography is essentially realistic must be acknowledged, and that this quality, so valuable in portraiture and the rendering of texture, is that that sets bounds to its aims. For instance: it may not attempt the representation of nude figures, excepting in its capacity of "an auxiliary of art," because it has no power to modify imperfections of form; and representations of the human figure, if not ideally treated, are only as obscene prints, shocking alike to modesty and cultivated taste. The province of the nude belongs exclusively to sculpture and painting, or, perhaps, more to the former than the latter, because it is less realistic.

Keeping in mind the twofold nature of photography—that is, an art-science—it is extremely difficult to understand why it should be deemed illegitimate for art to supply, *on the negative*, the deficiencies of science, particularly when those deficiencies are so great that, in some instances, they ruin the work. Then, can it possibly be "a weakness in the photographer" so to combine his means as to enlarge his powers? I would gladly accept the authoritative assertion of Mr. Macbeth that it is a "weakness," but reason and public taste are against it.

However, there is a kindly warning against unskilful and over-retouching of the negative to be gathered from Mr. Macbeth's critical remarks, for which he deserves gratitude, and I for one will not withhold it.

W. Hanson.

M. KLARY'S LIGHTING APPARATUS.

A very good proof of the energetic disposition of our German photographers is afforded by their easy accessibility to improvements and perfections of existing methods. Experience in these latter days has often shown this, but our ardour does not carry us so far as to snap at every bait thrown out, and sacrifice the high sums demanded for the "secrets" of our art which are offered to us by circulars. Indeed, he who "goes in" for such things with great expectations is almost always disillusioned, and the greater his disappointment the less will be his ability to distinguish what is really useful in the secret he has bought.

Amongst the "magicians of photography" who have lately defiled before us is M. Klary, who, by some specimens of very fine, artistically-arranged photographs, shows that he is a thorough artist and operator, and offers for a sum of one hundred francs a new lighting apparatus. Now I have not read M. Klary's pamphlet, and can, therefore, express no opinion as to whether his directions for the production of artistic pictures, for lighting and posing, &c., are worth the price asked for them, so I shall confine myself to the practical part and describe the so-called Klary's apparatus as I have seen it in a glass house.

Anything quite new one could scarcely expect to find there, as most of the pieces have been used in studios here and there, though they may never before have been all gathered together in one glass house. Everyone will, however, bear me out in saying that the screens are so simple that, had he been deprived of his curtains, he would have collected a number of the same or, at least, similar screens. The simplicity of the screen and the beautiful results obtained by means of it are, however, great recommendations of this method of lighting; and the small cost of making a screen places it within the reach of everyone for experimental purposes.

Before going on to describe the screen I must express my regret that M. Klary did not put a more suitable price upon his pamphlet, as I feel convinced he would have found it to his advantage, and he would have also contributed more to the progress of our art.

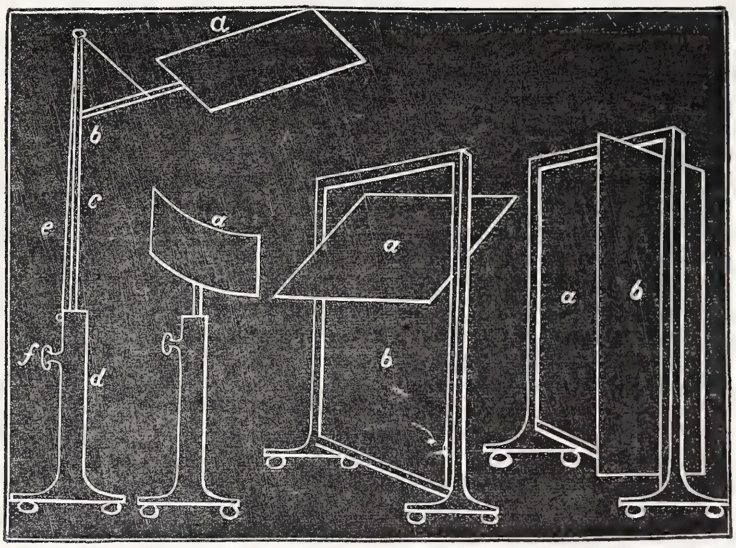

FIG. 1. FIG. 2. FIG. 3. FIG. 4.

Fig. 1. The head-screen is a light frame about 150 by 70 centimetres in size, having white cotton or stuff stretched on it. This frame, as the figure shows, is attached to a rod which moves up and down at the hinge *b*, which connects it with a strong wooden rod *c*. The latter runs down into the stand *d*, and may be raised or lowered like a head-rest, being kept at the desired height by the screw *f*. By means of the string *g* the head-screen may be fastened higher or lower at any required angle. The whole framework is about six feet high, and may be raised a few feet higher. A screen very similar to that described has long been in use in America, only the Americans use blue gauze stretched on it.

Fig. 2. The reflector *a* consists of a bent screen, the dimensions of which are 80 by 53 centimetres, and having glazed batiste stretched on the inner or concave side. This reflector is placed in a stand similar to that of the head-screen or rest, and can also be raised or lowered at pleasure.

Figs. 3 and 4 are frames about six feet high. Each is furnished with two movable screens, *a* and *b*, which are all covered with white stuff. They are used partly as reflectors and partly to keep off light from the lighted side, or to admit streaks of light.

The lighting is so arranged and the sitter so posed that no irregular light shall fall in general upon him, and with the head-screen, which is placed on the side in shadow, the top light is divided according to taste, by moving the screen backwards or forwards, higher or lower. Too deep shadows are lightened with the concave reflector, too strong side lights are modified or kept off by the screens 3 and 4.

I have seen studios in which there were no curtains and where the light was only regulated with the simple screen, and, practically, every lighting can be got with the screen that a curtained studio affords.
—*Photographische Monatsblätter.* T. H. Voigt.

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NOTES ON PHOTOGRAPHIC CHEMICALS AND THEIR ADULTERATION.

[A communication to the Bristol and West of England Amateur Photographic Association.]

The following notes arise from some anomalous results that have been observed by myself while making some photographic experiments. It seems probable that chemical purity alone, however important, is not all that is actually necessary for the highest state of photographic manipulation. The purity of the different reagents is of the utmost importance to the chemist, but is even more so to the photographer. Sometimes the latter finds a difference in the working of baths and solutions that chemistry alone cannot explain, and which very often remains a complete mystery.

The object of this communication is to show to the members that *physical* properties have to be remembered as well as the *chemical*. Most, if not all, crystals, especially when in a minute state of division, are affected by every ray of light having actinic power that falls upon them—a fact which is not often sufficiently alluded to in manuals and other works on photographic science. To prove that this curious fact is not a mere theory I exhibit several experiments, the most striking of which is the exposure of five or six simple substances to the actinic light of some magnesium ribbon.

The room is now darkened, and on opening the box the different substances are seen in an intense state of vibration—so rapid as to give forth a vivid light having different colours according to the rate and power of the waves. On examination it will be found that only the external particles, or those in direct opposition to the magnesium light, are affected. When they are removed the underlying particles will be found perfectly quiescent and dark. The light evolved in this remarkable manner continues for a considerable time, and is so bright that it can be seen all over the room.

[Experiments were then described pointing out what portion of the spectrum contains the greatest quantity of actinism, and also to prove its presence in the invisible rays by reducing their rate of vibration, and so rendering them appreciable by the human eye.]

I now exhibit some samples of reagents that have been sent to me for analysis, and will explain the most simple methods of ascertaining their purity or impurity. The first is some distilled water purchased this morning. It is found to be free from all solids—such as sulphates, nitrates, carbonates, and chlorides—but contains a large proportion of ammonia, which, being volatile, has passed over with the condensed steam. This is instantly detected by Nessler's delicate test, which shows by the colouration that a considerable quantity of ammonia is present.

The necessity is thus shown of throwing away the first portion of the distillate that comes over, and which, of course, contains those things in the original water that are volatile. It may be that the presence of ammonia would account for many of those unaccountable occurrences before alluded to. It cannot be detected by the smell or taste on account of the comparatively small amount, and yet the reaction is so strong as to cause a great disturbance in the Nessler, although the quantity in the sample present does not exceed two or three parts in every million.

Some samples of glacial acetic acid I show contain traces of lead, copper, sulphuric, hydrochloric, and sulphurous acid. In one is manifested an empyreumatic, tarry matter, which separates when neutralised with ammonia. The sulphurous acid is detected by the evolution of nascent hydrogen—a very pretty, although well known, method. To some of the acetic acid I add some pure hydrochloric acid and a little zinc. In the mouth of the glass flask I place some moistened lead test paper. The sulphurous acid present is decomposed into sulphuretted hydrogen, which announces itself by discolouring the lead paper.

A sample of gallic acid is shown, by means of a solution of gelatine, to contain a trace of tannic acid. An apparently-pure specimen of nitrate of silver is placed upon the table adulterated with saltpetre to the extent of *ten per cent*. The only correct mode of testing the nitrate is by quantitative analysis, thereby ascertaining the amount of oxide of silver.

Iodide of zinc in iodide of cadmium and iodate in iodide of potassium are not uncommon. A continental sample of the latter I exhibit. The impurity is easily detected by a little tartaric acid and starch solution. If any iodate be present it is quickly detected by the development of the well-known blue colour. A quantity of hyposulphite of soda examined is proved to be mixed with sulphate.

W. W. Stoddart, F.C.S., &c.

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THE IODISING OF COLLODION WITH ANILINE SALTS.

[A communication to the Photographic Society of Vienna.]

The idea of using organic iodides and bromides for the salting of negative collodions is already old. Amongst the most fortunate of those who have experimented in this direction was Dr. van Monckhoven, who recommended the employment of iodic and bromic ethylamines. His recommendation was supported by the observation that after a long time ammoniac iodide in alcohol forms iodic ethylamine, and that therefore a collodion prepared with the latter would have the properties of one that had been long stored up. The preparation of the iodic ethylamine is, however, attended with difficulties, and generally this method of iodising has not made any way for itself in practice. This interesting result, which furnishes the alcoholamines of the sebacic acid series as iodising salts, caused us to experiment upon the benzoic with the amines. We chose aniline, the prototype of the aforementioned series, as the starting-point for our experiments. It possesses, as does its salts in a much less degree, the property of absorbing bromine and iodine.

We prepared hydriodic acid and hydrobromic acid aniline by dissolving three parts of aniline, three parts of potassic iodide, and two parts of potassic bromide in as little water as possible, and then adding alcohol to the solution. The filtrate of crystalline residue (nitre) gave, after evaporation for a long time in the water bath, a few coloured needles of the aniline salts, and with these we prepared two collodions:—

1. One only iodised by mixing a solution of 4·0 grammes of hydriodic acid aniline in fifty grammes of alcohol with three times its volume of two-per-cent. raw collodion.

2. One bromo-iodised by a solution of 3·4 grammes of hydriodic acid and 0·5 of a gramme of hydrobromic acid aniline in fifty grammes of alcohol.

The collodions became a strong golden yellow immediately. They had the same iodine and bromine contents as an ordinary negative collodion. Both gave an equally unfavourable result. The films sensitised in a ten-per-cent. silver bath were very equal, but gave thin, very insipid pictures; the exposure required was somewhat—certainly not very much, still a little—longer than that of ordinary collodion. As from the tendency of aniline compounds to decompose one could scarcely have looked for anything else; the aniline collodions were quickly decomposed, and in the course of two or three weeks they had already become a deep red.

We communicate these unfavourable results only because they add to the systematic knowledge of the iodising of collodions.

Josef Maria Eder, M.D., and Victor Tóth, *Captain.*

SCIENTIFIC JOTTINGS.

We have still another chemical to add to the list of antiseptics in the liquid already useful in other ways—carbon disulphide. Hugo Schiff (*Deut. Chem. Ges.*) gives an account of the flesh of various animals being exposed to the vapour of this liquid, a few drops serving to keep sweet everything exposed to it. Being volatile it will penetrate in all directions, and it is a question whether it might not be a useful plan to place a drop or two of it in all packets of gelatine plates when any doubt as to their keeping qualites exists.

In the same journal is an article by J. Lund, in which some experiments are described, which may be of some assistance in helping to elucidate many phenomena of sensitising and development. He found that it is possible to add certain matters, chemically entirely inert to chemicals of an active nature, with the effect of almost stopping the action of the more energetic material. Glycerine, for instance, added to strong hydrochloric acid acts, comparatively, in a very feeble manner, slowly dissolving iron nails which were put into it. With sulphuric acid and glycerine the effects are almost the same. A mixture of soot and strong acid reduces the action to a minimum, but on removing the soot by filtration the acid acts like fresh acid.

We also note a process for burnishing iron which should be very useful in connection with the various steel instruments, such as rolling-presses, &c., used by photographers. The surface of the article is painted over with linseed oil and heated, whereby, together with separated carbon, ferroso-ferric-oxide appears to be produced, which forms the essential protecting layer. Articles which cannot be heated may be dipped into an acidulated solution of ferric chloride, whereby a black layer (ferroso-ferric-oxide) is formed, which, when dipped in hot water, becomes firmly fixed on the iron, so that after drying it can be rubbed with linseed oil. The advantages of burnishing with ferroso-ferric-oxide (smithy scale burnishing) consists in the fact that it is done much more quickly than the burnishing with ferric oxide, and that it is more beneficial to the iron than the latter. The most suitable process for the steel roller, or even the plate of a rolling-machine, seems to us to be the following:—Place the article for a few minutes in a solution of cupric sulphate, until a fine copper coating is formed on its surface; this, after being washed with water, is treated with a solution of hypo., slightly acidulated with hydrochloric acid, when a bluish-black coating of cupreous sulphide is obtained, which is not affected by air and water. The surface should be well washed with water, dried, and polished.

As the iodine and starch reaction is one of the most delicate modes of testing for hypo., our readers will do well to make a note of certain conditions under which its action is considerably or entirely impaired. The presence of certain nitrogenous organic bodies have this evil effect. Thus albumen introduced into the water which holds in suspension iodide of starch causes the disappearance of the colour; and if albumen be mixed with a solution of starch the addition of a saturated aqueous solution of iodine produces no colouration, unless the iodine be added in great excess. As albumen added to an aqueous solution of iodine causes the colour to vanish, there is probably formed in the above-named case a direct combination between the iodine and the albumen. If a little albumen be mixed up with starch in a mortar, and iodine, drop by drop, be allowed to fall upon the mixture, each drop produces a temporary blue stain which disappears, as the liquid, by spreading, meets with a sufficient quantity of albumen. These details have an obvious and interesting bearing for photographers especially.

A new colouring matter, sensitive to light, has been found to reside in the retina of the eye, and some very extraordinary experiments have been performed with it. We merely name it here, as an article will be found elsewhere in our columns treating the matter more fully.

We close our *Jottings* for the month by calling the attention of carbon-printing experimentalists to an examination which has been made of twelve different pigments found in Pompeii. They comprised yellow, brown, green, and one—to which photographic interest alone will attach—of a rose colour. This remarkable solid and fast pigment, which had lain undisturbed for not very far from two thousand years, was as brilliant and bright, probably, as when first made. One would think that if its composition or that of one of its constituents, could be discovered and imitated, it would be a desirable colour for adding to the black in tissue-making, as it is evident that some means of beautifying the greenish-black tone which a pure black pigment alone gives is a necessary evil. The author of the paper is of opinion, judging from various statements in Pliny, the text of which he quotes, that it is not improbable that this remarkable rose colour employed by the Pompeians may have been obtained by saturating a white clay with the compound colour produced from Tyrian purple (from *purpura* or *murex*), extract of Kermes (*Coccus ilicis* from *Quercus cocciferi*), and madder extract. This point he hopes to determine experimentally.

FOREIGN NOTES AND NEWS.

Dr. Schnauss' Amendment of his Remarks on Carbon Residues.—A Substitute for Starch Paste as a Mountant.—A Transparent White Opaline Film for Transparencies.—A Retouching Powder.—A Convenient Stopper for Varnish Bottles.—A Cause of the Darkening of Oil Paintings.—A New Photographic Apparatus for Field Work.—Formula for Purifying Commercial Gutta-Percha.—An Experiment to Show the Variations in Colour of certain Double Iodides.—On Stereoscopic Slides.

In a short note in the *Archiv* Dr. Schnauss corrects a statement he made in his recent article on the utilisation of carbon residues. It was that the pigment could be recovered from the washing water by allowing it to fall to the bottom, as it would naturally do after standing some time. He now recollects that the most commonly-used pigment, carbon, though insoluble in water, is present in such a finely-pulverised state that it becomes mixed with the glue contained in the solution so as to form a black emulsion, from which no sediment is thrown down, even after standing for weeks. Another method must, therefore, be found to recover this residue; that is, if, after all that has been said on the subject, it still be thought that the game is worth the candle.

In the same journal there are a number of wrinkles of greater or less novelty, from which we extract the following:—As a substitute for starch paste for mounting photographs, Herr Bloede recommends gum tragacanth prepared as follows:—Dissolve a quarter of a pound of gum tragacanth in a quart of lukewarm water, and after solution press the mass through a cloth, and the result will be an excellent mounting medium.

The same gentleman seems also to be the sender of the following transparent white film for transparencies:—He says gelatine and zinc white are not always fine enough, but a film perfectly free from granularity is obtained by running an edging or border of a fatty or caoutchouc solution round the negative, which is then laid down in a horizontal position. Thirty grammes of gelatine are then dissolved in 180 grains of milk, after having been allowed to swell at a gentle heat. The solution is then filtered through linen, the quantity given being sufficient to coat a plate 15 × 12 inches. It is poured over it, and allowed to dry in a moderately-warm room. In time the film becomes quite hard and insoluble, and may be protected by negative varnish or collodion, and has then the appearance of ivory.

Herr Fritz Haugk contributes a formula for a retouching powder and a convenient stopper for varnish bottles. The powder is prepared by adding two parts of dextrine to one of extremely finely-powdered colophonium, and mixing them well together. The mixture is said to be suitable for both negative and albumen positives, and is best applied by means of a leather stump. The "dodge" for closing varnish bottles is rather ingenious. It is a stopper made of good, pure wax, or a cork coated with melted wax. Cork stoppers, without the waxen envelope, are always sticking in the neck of the bottle, and when it is forcibly withdrawn small particles are torn off, which fall into the bottle and dirty the varnish.

Talking of varnish reminds us that much of the discolouration of oil paintings and photographs finished in oil colours is caused not by the varnish, as is often supposed, but by the use of cinnabar (vermilion). This colour, when mixed with white lead, soon becomes dark, until at length it is a brownish black; but if the cinnabar be intimately mixed with an eighth part of flower of sulphur before being rubbed down with oil it is much more stable. It is also said that the most durable of all oil paintings are those that have had a first painting or substratum of size colour.

From Russia comes a rumour of a wonderful new apparatus for photography in the field, the size of an ordinary knapsack, in which there is a complete photographic laboratory and chemicals for six months' work. It is asserted that the Kowako apparatus can enlarge a micro-photographic dispatch 2,300 times, and that this enlargement can be made either by night or day. Is this new invention a re-invention of the Telemeter, or is it really something new? No particulars have as yet come to hand, but doubtless in time we shall hear all about it.

In the *Pharm. Journ.* Herr Willmarth gives the following formula for purifying the gutta-percha of commerce:—Dissolve one part of raw gutta-percha in sixteen parts of sulphuretted carbon, shake up the solution with animal charcoal, and filter under a glass bell. After filtration pour the fluid into a vessel containing four times its volume of alcohol, and shake it up; then let the precipitate produced by this treatment settle, after which decant off the liquid until the sediment remains in the form of a thinnish cake, from which the sulphuretted carbon is allowed to pass off into the air. From the decanted fluid the sulphuretted carbon is recovered by partial distillation in the water bath. Benzine may also be used to dissolve the gutta-purcha instead of the sulphuretted carbon.

Herr R. Böttger gives the following experiment for showing the changes of colour of certain double iodides:—Take two small tin beakers and coat the outside of one of them with yellow mercuric iodide and iodide of silver to which a little dammar varnish had been previously added, and the other with a little dammar varnish and the magnificent red mercuric iodide and cupric subiodide. Then fill the beakers with water of about 70° or 80° C., whereupon the yellow colour of the first beaker will be changed to a deep orange, and the red of the other to a blackish brown. Now empty the beakers quickly and fill them with water of a medium temperature, when the original colour will reappear with the rapidity of lightning.

Amongst the various plans proposed for the revival of trade during the present season of depression the re-introduction of stereoscopic views and portraits has several times been made of late, and has naturally called forth remarks from various quarters. Amongst others, Herr Goltzsch, in the *Mittheilungen*, has something to say on this matter. He quite approves of the revival, but thinks, and not without cause, that it will not be permanent unless the manufacturers of stereoscopes and stereoscopic slides agree to a concerted action in the matter of the size of mounts, distance between eyepieces, &c. It would be, he says, as reasonable for every man to insist upon dividing the circle or the themometric scale into any number of degrees that happened to suit his own particular taste as for every one to have his stereo. slides and lenses mounted to suit his fancy. To produce a sort of regularity he proposes that three standards should be adopted. These are—

2½ inches for the square of each picture.
3 ,, ,, ,, ,,
3½ ,, ,, ,, ,,

The first he considers most suitable for glass pictures, as it admits of the greatest degree of enlargement and of the simplest focussing for various breadths of vision. The second would, he considers, include the best of the existing paper slides; but for larger views and for portraits he recommends the third, as it admits of a longer focus, which is sometimes required by the perspective. In fact, he thinks that two and a-half inches does not give the perspective required by eyes placed two and a-half inches apart, so that by using objectives of longer focus the distance might be increased without disadvantage to three and a-half inches. We fear, however, that the day of the stereoscope has passed for ever, in spite of all efforts to revive it; and even in its palmiest days we have detected people who ought to have known better peering with one eye closed into each eyepiece alternately, thinking it merely a new and rather mysterious sort of magnifying glass.

Meetings of Societies.

MANCHESTER PHOTOGRAPHIC SOCIETY.

An ordinary monthly meeting of this Society was held at the Memorial Hall, on Thursday evening, the 8th inst.,—Mr. Alfred Brothers, F.R.A.S., President, in the chair. The minutes of the previous meeting were read and confirmed.

The President called attention to the following resolution of the Council, and requested members to supply lantern pictures and other objects of interest on the occasion:—"That the next meeting of the Society be a social one, and that an extra provision be made at the cost of the Society."

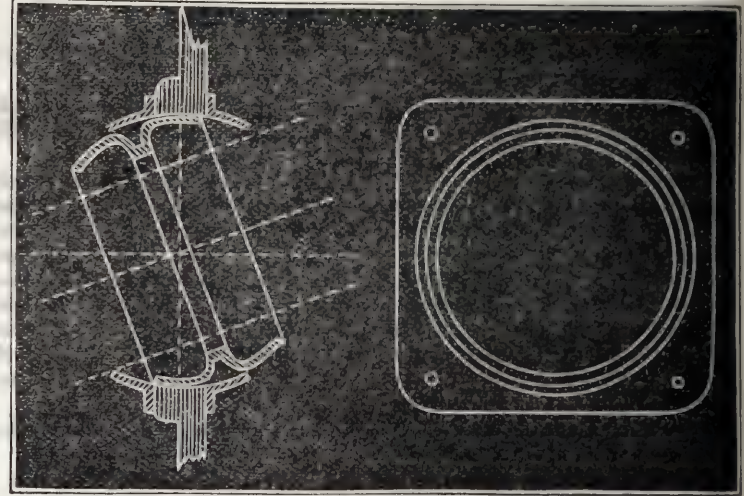
Mr. Coventry volunteered to work the lanterns on the occasion.

Mr. E. E. Wigglesworth and Mr. S. H. Ashley Oakes were elected members of the Society.

Mr. Wade exhibited a print by the Prussian blue process. At the time the print was produced, four years since, it was cut in two, and one half exposed to the weather for a month. This half was found to be quite equal to the other, no signs of deterioration being visible in either.

Mr. James Young exhibited a gelatine emulsion plate, which had been dried with a piece of non-actinic paper over it, in which there chanced to be a pinhole. This small aperture had acted as a lens, and projected an image of a venetian blind on to the plate, sharp enough to show unmistakably how it was produced.

Mr. Noton showed a ball-and-socket lens mount for camera front, *à la* Shadbolt. The "ball" (an oblate spheroid) is three seven-eighths diameter, two inches through, screwed (20) inside to take an outside screw three inches diameter, or other smaller size by using an adapter.



An angle of 20° from the perpendicular, in any direction, can be had when the lens jacket is two and a-half inches diameter. A much greater angle is obtainable with a less diameter, a two-inch giving an angle of 30°. The whole of the brasswork weighs seventeen ounces four drachms.

Mr. Chilton brought before the meeting some transparencies by the gelatine emulsion process—"Franklin's" formula—which were much admired.

Mr. Frankland having exhibited a number of carbon prints by Mr. Higginson, of Southport, which excited great interest and were much admired, said he had much pleasure in bringing these specimens before the meeting. Perhaps no department of photography had received so much attention of late as carbon printing, which many had attempted and in which many had failed. M. Lambert, however, seemed to have imported new life and spirit into it, and that which before seemed to be commercially a failure promised to become a success. He (Mr. Frankland) said his friend Mr. Higginson was one of the first workers under a license from M. Lambert, and the pictures on the table sent at his request were specimens of Mr. Higginson's everyday work. They were not only perfect as carbon work, but as art productions also; and the fact that gentlemen from all parts of the country had visited Mr. Higginson in connection with the subject testified that he had done in carbon what had not previously been accomplished. He (Mr. Frankland) had had an opportunity of going through the whole of the various operations from the sensitising of the tissue to the stripping of the finished picture, and had concluded that the production of small work in carbon was a commercial success. He hoped the Autotype Company would see the wisdom of returning to their old liberal policy of supplying material to the profession without insisting on a license being taken to enable purchasers to use the materials when bought.

A vote of thanks to each of the gentlemen who had contributed to the interest of the meeting concluded the proceedings, and the meeting was then adjourned.

WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.

An ordinary meeting of this Society was held at the Commercial Hotel, Bradford, on Monday, the 5th instant,—Mr. John Smith, President, in the chair.

The minutes of the previous meeting having been read and confirmed, Mr. Shepherd was elected a member.

Mr. J. Crosthwaite then read a paper on *The Dusting-on Process* [see page 88], and exhibited a few specimens of reproductions by that process.

The Chairman said that he considered the paper a very practical and exhaustive one, and thought the writer had made out a strong case for the process, which evidently seemed likely to be of great use to the photographer for many purposes for which the ordinary processes were not so well adapted.

Mr. Greaves inquired if Mr. Crosthwaite had tried the process as applied to enlarging.

Mr. Crosthwaite said he had not, but intended doing so, when he should be happy to communicate the results to the members.

Mr. Greaves observed that he had tried the formula as given by the Autotype Company in their *Manual*, but had had great difficulty in getting rid of the yellowness arising from the bichromate. He had tried strong solution of alum and hydrochloric acid for removing it, but had not been entirely successful.

In reply to the Chairman,

Mr. Crosthwaite said that he had given to the reproductions on the table exposures varying from fifteen to forty minutes. He had found a maximum exposure invariably the best; it simply meant a little longer time in development.

Mr. Greaves suggested that it would be a very good method of securing vignettes for carbon printing, as the negative might be coated, then printed under an ordinary vignetting board, and developed in any manner the operator thought proper, thus producing a negative that would not require vignetting, but could be printed like an ordinary negative.

A vote of thanks was then presented to Mr. Crosthwaite for his able paper.

Mr. Sachs exhibited a number of pictures printed in carbon, with a surface very highly glazed, as an example of the advantage of slow drying after mounting.

After some further conversation the meeting was adjourned.

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FRANKFORT-ON-MAINE PHOTOGRAPHIC SOCIETY.

At the last meeting of this Society, Herr von Bosch occupying the chair, there was very little business of interest transacted beyond taking leave of Herr Voigt, the co-editor of the Society's organ, on the occasion of his departure for a three months' stay at Barcelona.

Herr Bamberger, Jun., stated that he had audited the accounts and found them correct.

Herr Hartmann showed a sketch he had made for the card of membership he had undertaken to furnish.

Herr von Basch called attention to an unfavourable critique of Dr. Stein's book on *Light in the Service of Science* which had appeared in the *Mittheilungen*, saying that it placed the object of the book in a false light.

Dr. Stein followed, and in a speech of some length made a protest to the same effect, in which he gave some details as to his method of photographing sound waves.

Herr Geldmacher read a newspaper paragraph professing to explain the Aubeldruck process.

Dr. Stein remarked that he thought no weight should be given nor attention paid to such assertions unless sanctioned by the inventor, and as it so happened this paragraph was authoritatively contradicted a few days after by Herren Aubel and Kaiser.

The meeting was thereafter adjourned, but about the time the next meeting should have been held a long letter, descriptive of his journey to Barcelona and of the following import, was received from the absent member:—Some fourteen years ago, when he had occasion to visit the East Indies, he passed through Geneva, Lyons, and Marseilles, and found the photographs in the show-cases of these cities in every respect superior to those produced in Germany. They were more tastefully arranged, and better posed and lighted. Now, however, he was glad to be able to say that any comparison would be favourable to his compatriots. He was astonished to see how little attention seemed now to be paid at Lyons or Marseilles to the show-cases; indeed, in the interests of photography they had better be closed altogether, so faded and neglected-looking were their contents, and showing the need for the silver process to be replaced, as he has no doubt it will be eventually, by the carbon process. At Marseilles he saw some very fine carbon pictures produced by M. Chapins, and some large pictures retouched in oil by M. Fabre. From Marseilles he went by steamer to Barcelona, and from thence to Madrid, where as yet he had visited but one studio—that of Senor Marti—which struck him as being very fine. Senor Marti's place of business is a corner house in the fashionable quarter of Madrid. There the eye lights upon large show windows filled with large and small photographs, and is attracted through the ever-open door to a spacious hall within, where specimens of Senor Marti's art are displayed with a taste and profusion which Herr Voigt has never seen equalled even in the largest towns of Europe. The display is especially brilliant when lighted up at night; for in Madrid, where people swarm in the streets until twelve or even one o'clock, all the photographers light their windows and show-cases. In the centre of Senor Marti's exhibition hall there is a series of seventy-six transparencies—views in the city, of Moorish remains, &c.—most of which are carbon prints. A dark-red velvet carpet and curtains throw out the pictures on the walls, which are equal to the best German productions, and consist of six portraits four feet high, enclosed in frames six feet high; eight portraits three feet; and eight two feet high. Three gilt frames, running the length of the wall, are filled with cabinet and *carte-de-visite* photographs, some of which are portraits, some *genre* pictures, and some costume pictures. From this hall one passes into the reception-room, where Herr Voigt was met by Signor Marti, who kindly showed him through the premises. The glass-house was on the roof of the house, and was glazed with ground glass in order to keep off the glare of the direct sunlight. Next the glass-house was the enlarging room, in which a dyalitic Monckhoven enlarging apparatus was placed. After passing through all the other working rooms they descended to the cellars, and there Herr Voigt found an apartment fitted up for the manipulation of carbon prints on the exact pattern recommended by M. Liebert, the underground situation being chosen for its greater coolness. As yet Herr Voigt has visited no other photographic establishment, and it will be some time ere his enthusiasm over that of Senor Marti may allow him to do so without feeling inclined to make comparisons to the disadvantage of that which is not Marti's.

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Correspondence.

EMULSIONS AND DEVELOPERS.

To the Editors.

Gentlemen,—Mr. Warnerke does not seem to have understood the drift of that part of my letter anent zinc bromide. I am, nevertheless, obliged to him for his letter.

I have always understood that when one wishes to arrive at the correct equivalent of a substance—in this case zinc bromide—care is taken that the substance be as pure as possible—not a mixture of that substance with another. In the case of zinc bromide contaminated with zinc oxide (this is the basic salt in question, I understand) the equivalent would appear to be higher than it really is—of course supposing that the quantity of oxide is not known. Now, at this time, not knowing the nature of this impurity, and wishing to find the real atomic weight of zinc bromide as contrasted with that given in the table of the Almanac, I found it necessary to treat the impure salt as I described.

According to Mr. Warnerke the "equivalent" with his sample is 118·83 against 117·4 obtained by me. This result, if correct, seems to point to my sample as being the purer of the two. But, as I noticed in my last letter, the symbol for zinc bromide, as given in the Almanac, is $Zn\ Br_2$, and the atomic weight 225, or 225·2.

If we take the "old" atomic weight of zinc, 32·67, and add to it 80, the atomic weight of bromine, we get 112·6—a figure more nearly corresponding to the equivalent obtained by Mr. Warnerke and myself. If this were the true theoretical weight the symbol would be Zn (=32·6) Br (=80). I find that Mr. Warnerke, at page 89 of the last volume, states that, in theory, 1·59 grain of silver nitrate is necessary to convert one grain of the bromide. This data, when worked out, gives 106·918 as the theoretical atomic weight of zinc bromide. In this case I ask—What, then, is the symbol?

I was surprised to find that neither yourselves nor Mr. Warnerke noticed my impeachment of your table of symbols and atomic weights. Zinc is, certainly, a diatomic metal, and, as such, its formula should be $Zn\ Br_2$; but, in order to make theory and practice to any extent agree, it would be necessary to place 32·6 as the atomic weight of zinc, and 40 as the atomic weight of bromine. Even then the results would be considerably at variance.

In the formula given me by a photographic friend the quantity of silver nitrate was not stated, as Mr. Warnerke might suppose. The directions are "two grains of silver nitrate in excess," and ten grains of zinc bromide to be decomposed. In this case it will be seen that it was necessary to be able to weigh out a definite quantity of *pure* bromide. I do not know how the zinc oxide in quantity would affect an emulsion with the bromide in excess; but in the case of silver in excess it would be decomposed by the restraining nitric acid into zinc nitrate and water, thus—$ZnO + 2\ HNO_3 = Zn\ (NO_3)\ 2 + H_2O$, and thus could do no harm if not present in great quantity, especially in a washed emulsion; but the quantity of restraining acid would be reduced by the reaction.

I do not know how I came to overlook the fact that silver nitrate dissolves silver bromide, or, at least, brings it into a state of finer division, seeing that I have often noticed this effect when precipitating silver bromide in water. In this case, it is possible that an equally fine emulsion would be obtained by adding the soluble bromide to the silver nitrate, instead of *vice versâ*.

I have succeeded, at last, in making a highly-sensitive washed emulsion by discarding the "organic" pyroxylines, and substituting a good quality of the ordinary kind. I am indebted to a friend for the formula by which I have made this emulsion, which (not the pellicle) is organified in a very simple manner with albumen. The sample I have made is six times as rapid as the ordinary "Liverpool," and three-fourths as rapid as gelatine emulsion, as made by myself. I am making another batch, which I hope will equal gelatine.

I think that in this present state of gelatine emulsion—I refer to its bad keeping properties—its rapidity is its principal advantage; so that, if we can make collodion emulsion as sensitive, gelatine will lose a great deal of its value. At the same time it is possible that more sensitive gelatine emulsions may be made in the future than any of which we have yet seen the formula.

It appears to be generally considered that gelatine emulsion is not affected by the metallic base of the salt employed—at least not so much so as in the case of collodion. I think some experiments in this direction are required. I shall probably try, shortly, the effect of making a gelatine emulsion with a decoction of pyroxyline instead of plain water, comparing this with another, identical in every respect except as to this addition. I shall be prepared to find that the "pyroxylinised" gelatine fogs when prepared with silver in excess without restraining acid. If so, I think that my theory will be proved, namely, that gelatine does not act as a "restrainer of fog," but that that organic constituent is not present in gelatine, and which, in combination with silver bromide and free silver nitrate, causes fog in the case of collodion emulsions.

I should like to know whether you, or any of your readers, have proved by actual experiment that free silver has a "fogging action" on *pure* silver bromide. Suppose that we were to precipitate two portions of silver bromide in water, under the same conditions, except that one portion is "restrained" by nitric acid, free silver being present in both instances: if the silver bromide were then washed and ground up separately in collodion or gelatine, would the "restrained bromide" give a clearer image than the other? I leave the quality of the images entirely out of the question, as having nothing to do with the solution of the problem of the action of free silver on the silver bromide, either directly or indirectly.—I am, yours, &c., HERBERT B. BERKELEY.

Cotheridge Court, Worcester,
February 20, 1877.

THE PHOTOGRAPHIC EXHIBITION.

To the EDITORS.

GENTLEMEN,—Permit me to correct a slight error that appears in your report of what I said at the annual meeting of the Photographic Society of Great Britain. "He, however, took the pessimist's view," should be—"He did *not* take the pessimist's view." In saying this I referred generally to the causes that affect the success of our exhibitions, which, I maintain, cannot be much influenced by the time of opening being a few days or weeks, more or less, earlier or later at a period of the year when alone a suitable gallery is to be found available for our purpose. The terms of our tenancy are such that we can avail ourselves of the use of the gallery early in September. This being now generally understood by those who desire to exhibit, there can be no difficulty in sending works produced in the previous year, supposing that the artist is unable to work for the exhibition until the months after the opening. This objection, therefore, as regards all future exhibitions falls to the ground, as far as exhibitors themselves are concerned.

I deplore, in common with many others, the apathy that marks the conduct of many who, by the exhibition of their pictures at a trifling cost to themselves, might assist in raising the standard of our exhibition, and by so doing ennoble themselves; for there can be no doubt that the general status of photographers must be elevated by a good public report of works exhibited by masters of the art.

As a matter of fact I repeat that, as regards financial success, it is of little moment whether the exhibition takes place early in September or in the middle of October, closing on the 5th November, as in 1874, supposing that we have the privilege of making use of the gallery embracing the whole of these periods. Judging from the favourable results obtained in 1875 I am led to this conclusion.

In 1874 the exhibition opened on October 14th and closed on November 5th, showing a loss to the Society of £42 6s. 1d. In 1875 the exhibition opened on September 29th and closed on November 19th, showing a profit of £4 9s. 3d. In 1876 the exhibition opened on September 9th and closed on November 14th, showing a loss of £35 16s. 6d.

Without wishing to be dogmatic, I think that no conclusion can be fairly drawn from the above recorded facts that the exhibition must be necessarily a failure on account of fixing the opening day, at a given season of the year, a few days earlier or later of the time which the Society has at its disposal.

I quite agree with your correspondent, Mr. Viles, that the Council should, without loss of time, announce to the photographic world their decision as regards the date of opening this year's exhibition.—I am, yours, &c., RICHD. W. THOMAS.

10, *Pall Mall, S.W., February* 17, 1877.

TRANSFERRING NEGATIVES.

To the EDITORS.

GENTLEMEN,—*Apropos* of your article on *Transferring Negatives,* in last number, the method you describe of coating the glass with either plain or iodised collodion to prevent the film from splitting up is an excellent one; and if I remember rightly it was one among several of the "thousand-and-one" useful dodges incident to the working of my enamel process, of which I spoke when showing you that process in operation last summer—a matter which had probably escaped your memory.

Instead of using citric acid for loosening the film—and I observe that you recommend a very strong solution—I prefer sulphuric acid for various reasons, the principal one being that it parchmentises the collodion and renders it tougher. The strength of solution I prefer is one containing from one to three per cent. of acid. With some kinds of acid it will be found that the greater the strength the more difficult will it be to effect the removal of the film.

With reference to what was said at the last meeting of the Edinburgh Photographic Society about the non-arrival of my enamels in time for the competition at the Edinburgh exhibition, permit me to say that the fault lay exclusively with the carrier, and did not arise from my own mismanagement.—I am, yours, &c., A. L. HENDERSON.

49, *King William-street, E.C.,*
February 20, 1877.

TRANSPARENCIES PRINTED IN THE CAMERA.

To the EDITORS.

GENTLEMEN,—Your article on Mr. Brooks's paper, read at the meeting of the South London Photographic Society, touches upon my remarks as to the variation of tone being influenced by the exposure; but you doubt the possibility of utilising this power because "half-tones must suffer if increased exposure is given to influence tone or colour."

I desire to point out what not only yourselves but other members present did not take into consideration, viz., that the prolonged exposure, when desired, must be accompanied with a corresponding reduction of the illuminating power. To put it plainly, you must print in the shade. This I took care to specially point out; but I saw that the condition I insisted upon was lost sight of during the discussion, hence my troubling you with this reiteration. Given a perfect negative the prints are vastly influenced if printed in strong light or in shade.—I am, yours, &c., F. HOWARD.

February 19, 1877.

CARBON PRINTING.

To the EDITORS.

GENTLEMEN,—I am sorry my sister, "Alcestis," is displeased with the few words I wrote in your Journal of the 9th. I think if she had known *who* her sister is she would scarcely have advised her to try the carbon process.

I simply suggested that "Alcestis" had either omitted to give your readers a very important detail in her manipulations, or had achieved "what has before been considered impossible." Well, she admits the "preparatory whisk of a cloth sprinkled with powdered talc," which she did not mention in her first letter.

Then I took the liberty of pointing out that Mr. Johnson proposed collodion, both wet and dry, in the first edition of the *Autotype Manual,* and consequently some time prior to the publication of similar means by Mr. J. A. Spencer.

I do not see that my sister controverts either of these positions, and so, for my part, I am quite indisposed to take up further of your valuable space about this matter.—I am, yours, &c., NEMESIS.

February 20, 1877.

PROPOSED MEDAL OF PROGRESS.

To the EDITORS.

GENTLEMEN,—Mr. H. Baden Pritchard, in giving instances of how medals are given abroad for researches in photography, cites three instances—in each case foreigners. He might have gone nearer home, as I had the honour of receiving the special medal of the Photographic Society of France for the year 1871—an honour I value all the more as coming from another country than my own.

If the suggestion of Captain Abney should ever be carried out by our English Society I would beg to offer one suggestion, namely, that medals should only be given for published or patented processes. Witness one of the cases cited by Mr. Pritchard—that of M. Rousselon. When, some years ago, I publicly challenged that gentleman to show that the method known as "Photogravure, Goupil et Cie" was not substantially the same I had communicated to him, the only reply was that the process would be published shortly. I have waited in vain through several years for this proof, and have therefore every reason to believe that the method adopted by that gentleman is what I have all along believed it to be.

I give this as an instance of how anyone working a secret process, which may be his own or may not, may become the recipient of an award which he is not entitled to, not being the original inventor.

The Manor House, WALTER B. WOODBURY.
South Norwood, S.E., February 17, 1877.

To the EDITORS.

GENTLEMEN,—Permit me to suggest the propriety of the Council of the Photographic Society of Great Britain awarding a progress medal to either themselves or to the particular official to whom is entrusted the preparation and issuing of their journal, in the hope that the award may prove a stimulus to such functionary, and enable him to get the Society's organ placed in the hands of the members in something like decent time after each meeting.

If rival journalists who have presumably to attend to much besides the Society's report can have the latter in the hands of their readers on the Friday morning after each meeting, it is a standing disgrace to us that instead of our receiving the official report in about twenty-four hours after the evening of the meeting, as might easily be done, things are managed in so sleepy a manner that sometimes a week or two elapses before we are enabled to receive such report.—I am, yours, &c.,

London, February 19, 1877. A Member.

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MEDALS AND EXHIBITIONS.

To the Editors.

Gentlemen,—Before the Edinburgh Photographic Society's exhibition took place I had occasion to speak against the system of awarding medals. I did so chiefly on the ground that five or six men cannot by their award establish the superior excellence of a picture; or, in other words, that there is no exact measure for works of art, and, consequently, that the award of a jury merely shows the opinions of the men who compose it, without establishing the exact excellence of the subjects of their award. It may now be asked have the awards made at the Edinburgh Photographic Society's exhibition invalidated my position?

Allow me to state that, along with the other members of the Edinburgh Photographic Society, I believe that the jurors—all men of mark—were as good as could be had, and that their opinions are worthy of the greatest consideration; but still the fact remains that these have not been universally received. In the exhibition rooms I met many photographers, several artists, and a number of other people, some of whom are men of recognised taste in the higher circles of art, but I did not find a single one who thought the prize picture the best in the rooms. Some preferred other pictures by Mr. Kareline, and some preferred pictures by other photographers.

Mr. Norman Macbeth's very able paper on Mr. Kareline's pictures in your last number is well worthy of considerate perusal. Without doubt Mr. Kareline is an artist, and not merely a mechanical photographer. His pictures are very effective and carefully finished; but he indulges in peculiarities. He rejoices in strong contrast—one might almost say conflict—of lights and shades; and by introducing white curtains, large reflecting mirrors, and abounding accessories, he is apt to make these the chief part of his pictures. Even in his prize picture the chief feature is a long, white muslin curtain, against which a man sits in shadow—savouring, it must be said, somewhat of "trick." In his own style his composition is excellent, and his technics admirable; but, whatever the reason may be, his pictures generally are deficient in two of the great requirements of art—gradation and simplicity.

It is evident that pictures containing such mingled qualities of excellence and peculiarity give room for very different opinions being formed, according to the point from which they are reviewed. On the one hand we have opinions, worthy of consideration, expressed by the jury; and on the other we have opinions, equally worthy of consideration, expressed by men of acknowledged taste and culture in art. And to what conclusion does this lead us? Simply to this—that a limited number of opinions on works of art is no criterion of the excellence of the said works. This conclusion does not tell against the individuals who compose juries of award. The fault is in the system, which necessitates a jury giving a verdict they cannot warrant to be correct; and the argument against the system is strengthened by the fact that the opinions of our exceptionally good jury do not coincide with the opinions of men who are equally qualified to judge. In short, the motto of the medal system in art is "uncertainty"—a by no means satisfactory word.

But we are told that many excellent pictures would not have been sent to the exhibition if there had been no enticing medals. Let us hope that all the men who sent these many excellent pictures have each gained one of the sixteen silver medals or at least one of the sixteen bronze medals, or, at anyrate, are enabled to enjoy the consciousness that they had good intentions, which no doubt will sufficiently console them in their failure, and encourage them to "put in" for the next exhibition. It is to be feared there are, photographers though they be, men of not a very high type whose great desire is to gain a medal, that thereby they may push their trade; whilst others, no doubt, enter themselves for the lottery of awards with the feelings which one entertains towards a time-honoured institution. It has been the custom to have medals at exhibitions, and so an exhibition without medals may seem a poor affair. Well, we have had our age of "bronze," and may hope that ere long the love of medals will give place to the love of art; and that photographers will be contented to exhibit their works for the judgment of the public on their own merits, without thinking that the chief end of a photographer is to be distinguished by the sanction of five or six men.

I trust I have said nothing, either in letter or spirit, that seems to bear against the Edinburgh jury, who are all men of high standing. My remarks are directed solely against the system.—I am, yours, &c.,

Edinburgh, February 19, 1877. W. Neilson.

DALLASTYPY.

To the Editors.

Gentlemen,—I have just seen a paragraph in the *Paper and Printing Trades' Journal*, announcing that the *Journal fur Buchdruckerkunst* attributes to Pretsch the photogalvanoplastic process known as Dallastypy. The fact is, Dallastypy is not a photogalvano or photogalvanographic process at all. The *Journal fur Buchdruckerkunst* ought to hold its peace, as it meanly burked my letter, published here, exploding the Pretsch claims and Herr Leipold's backing thereof. The facts brought forward were not palatable. They had been published here in the country in which Pretsch had every facility given him that thousands of pounds could procure to prove his title to be considered a man of original invention, or a practical photographer and electrotyper, but miserably failed. If Pretsch had been an Englishman or a Frenchman, the *Journal fur Buchdruckerkunst*—long, lumbering name—would not have been so ready to credit him with other people's work. Aye, and if he who succeeds where others fail is entitled to what credit may be due, even photogalvanography—credited, as it has been, to Pretsch—was my work, though not my idea. The honour of the idea belongs to the Imperial Printing Office, Vienna, where experiments were made with Fox Talbot's gelatine and bichromate of potash process. Councillor Auer, the former director of that establishment, stated that the experiments were made under his directions. Pretsch stated that he had never heard of Fox Talbot's discovery, but that he had carried out all his experiments at his own private lodgings. Who is to be believed? Certainly not Pretsch, as it came out afterwards that Fox Talbot's process was described in the *Journal of the Photographic Society*, and that both Pretsch and the Imperial Printing Office, Vienna, took in that journal regularly.

I enclose you a specimen from a Dallastint block, which has appeared in this month's *Geological Magazine*, and has been machined with the type. The original was an albumen photograph. Perhaps I shall find, some day, *Journal fur, &c.*, claiming this invention also for the renowned Pretsch!—I am, yours, &c., Duncan C. Dallas.

February 21, 1877.

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Copying Pictures.—Copying daguerreotypes in reflected sunlight—that is to say, through the rays of the sun reflected from a small mirror on to the picture while it is being copied—dust it off before copying, with a fine camel's-hair duster, crosswise of the figure, not up and down, or you may spoil it. Never varnish old ambrotypes or ferrotypes that have not been varnished, or, ten chances to one, the whole picture will disappear; but you can revarnish those that have been once varnished, dented, or soiled, and it will greatly improve them. They should be copied in the shade. Copy card pictures or photographs of any kind from behind plate glass, and they will be much smoother. Another plan: wet them, and copy them the same way for enlargement; try and be convinced. In copying oil paintings a cloudy day is preferable; by no means copy in the rays of sunlight. They require three to four times as long as photographs to copy. Pictures copied the size of the original generally take twice as long as from life, the light being of the same strength; enlargements much longer, according to size. Focus copies without a diaphragm, but put it in or regulate before copying the picture. A side light is much better to copy by than a sky light. Your picture and camera should be on the same attachment board.—*Practical Photographer.*

Rather Unusual.—A novel means of bringing a refractory customer to reason has lately been resorted to by a well-known Berlin artist. It is stated that a short time since a German merchant went to the painter's studio and ordered a full-length portrait of himself, for which he agreed to pay six hundred marks. After several sittings the portrait was finished to the entire satisfaction of the artist, but not of the original, who angrily asserted that it was in no way like him, and failed to do him justice. He offered the painter half the stipulated price, however, but this the latter would not consent to take, so the testy customer said "he might keep his daub himself." The artist, considering that he had been unfairly treated, proceeded to turn the "daub" into a clever caricature of the merchant, whose face is familiar in the city, by adding a battered old hat and tattered coat to his attractions, and inserting a flute between his lips. Beneath he wrote "An Eastern flute-player in reduced circumstances," and in this guise sent the portrait to a certain picture dealer living in one of the most crowded thoroughfares in Berlin, begging him to put it well in view. Naturally the caricature soon became celebrated, much to the annoyance of the original, who bought the "daub" for the 600 marks agreed upon at the outset, but vowed he would make the artist pay for his treachery. His first attempt, however, failed, the court acquitting the artist on the charge of extorting money by means of a caricature. A fresh action is now pending, the accusation this time being that the merchant has suffered both in his private and public character by the scandal the affair has created. The tribunal must decide who is in the right; in the meantime the choleric merchant has paid with law expenses twice the original price for his portrait, and at the same time cannot hang it up on the walls of his reception-room, for which place it was destined.

EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale*, that being done at a small cost in our advertising pages. This portion of our columns is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

Cabinet lens and camera, stereoscopic lens, postage-stamp camera with six lenses, rolling press, show cases, &c.; wanted, backgrounds, posing chair, accessories, &c.—Address, H. Dunbar, 74, Paradise-street, Liverpool.

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ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

Physician.—Received.

Faber.—The chloride of copper solution may be applied either in the dark room or in daylight.

W. B. N.—The combination having the largest front lens will be the quicker, provided that the equivalent focus of both is alike.

Ajax.—We have no knowledge of the whereabouts of the person about whom you inquire, nor are we responsible for any statements made by advertisers in our outside pages.

James Edwards.—Your case is quite puzzling. From the behaviour of the silver it would seem to be impure; but we can better speak of this if you will forward a few crystals for examination.

J. S. Anderton.—The case is wellnigh hopeless. Why not take the portrait when the sitter has his eyes directed downwards upon a book? If this prove undesirable, recourse must be had to retouching.

G. Leach (Stockton-on-Tees).—The order for the advertisement of this correspondent was received too late for the last issue of the Journal. It appears in the usual place in the current number.

T. P. O. T. N.—We are quite alive to the value of your suggestion, and entertain the hope of being able to induce some manufacturer to prepare a graduated measure to suit the requirements of English photographers.

G. W. W.—Let the plano-convex achromatic lenses intended for the lantern objective be mounted as close together as possible without touching. The position and aperture of the diaphragm must be determined by experiment.

G. W. W. B.—We have *repeatedly* restored faded prints by the mercury process, and when we last looked over our collection of stereoscopic prints we saw some that had been restored in 1865, and which were in excellent condition.

C. H. S.—*Any* good emulsion will answer for producing small negatives for enlargement, no matter by what name the emulsion is known or by whom it has been manufactured. With regard to lenses, either A or C will answer quite well.

An Old Carbonist.—After dispatching to the printer the letter signed "An Old Carbonist," which appeared in our issue of last week, we received the sample of tissue and prints to which reference was made. The latter are all that need be desired.

Lionel.—If you will examine a "phototint" with a magnifying glass possessing moderate power it will be seen that there is a peculiar kind of texture, and to this, doubtless, is owing that "indescribable something" about these pictures which you like.

M. H. B.—To remove the silver stains from the opal glass tablets: pour on the centre of each a few drops of nitric acid and spread it over the surface by means of a strip of glass. The stains will disappear immediately on the acid coming into contact with them.

J. Duncan.—You have been misinformed. The only points claimed by M. Lambert in his patents are those which we have published in previous numbers of this Journal when giving details of his patents. The description of the chromotype printing-frame will be found at page 171 of our last volume.

Capt. Gubbins.—1. If the bath and other chemicals be in good condition instantaneous views may easily be taken for subsequent enlarging. A shorter exposure must be given than that necessary to ensure a good printing negative, and the development must not be carried too far.—2. Send to the publisher a list of the missing numbers, and if in stock they will be forwarded.—3. We regret to learn of the accident.

W. C. Crofts.—X and Y in your list represent the same kind of lens, subject, of course, to slight differences in price and focus. We have not tried either; but from what we have learned, upon inquiry, we conclude that they are not so well adapted for large groups as Z, the two kinds of lenses mentioned under this heading bearing precisely the same degree of relationship to each other as X and Y. The lens marked K is unsuitable, on account of its acting too slowly.

Rev. S. T.—The following is a method for preparing a relief suitable for the purpose indicated in your letter:—Having coated a small plate of glass with collodion of a very tough kind, apply next a rather thick coating of gelatine, containing very little bichromate of potash. Having removed the compound film from the glass (after being dried, of course) with *opaque* ink—such as China ink—draw upon the collodion surface the letters required, using a finely-pointed pen for the purpose. Next expose to sunlight, collodion side out, allowing the rays to fall upon the surface at a right angle; then place the pellicle in hot water, when the letters you have drawn will appear sunk on a raised ground, and from this an electrotype can be obtained. But an engraver would prepare a proper plate for you at far less trouble and cost.

Young Hopeful.—1. The film must be dried *without* heat.—2. Gelatine cannot possibly be liquefied by the heat of the sun in the course of printing, unless it be exposed before being dried.—3. Adopt the expedient of placing the printing-frame at the bottom of a tall box which will shut out the side light.

The Edinburgh Exhibition.—A correspondent complains of the deplorable condition in which the exhibits sent by him to the Edinburgh exhibition have been returned to him, evincing, as he says, more than a want of ordinary care by the Modern Athenians, although he promptly complied with an official request that he would forward a certain sum to ensure the necessary care and attention. The officials in question will doubtless be able to offer a satisfactory explanation.

G. S. R. inquires if "An Old Carbonist" will inform him where he can obtain the carbon tissue said by that writer to be "just the very thing." He observes that no truer words have ever been spoken than that "carbon does not require more skill than silver," for he succeeded far beyond his expectation the first time he ever attempted carbon printing, and he has not yet experienced a failure, notwithstanding he is using an old sample of tissue prepared for quite another purpose with French glue.

Cook.—Our correspondent desires us to record his experience with a whole-plate lens. He accidentally allowed the key of his studio to fall upon it, by which the outer lens of the back combination became fractured. He was in a state of great despair, as the lens was urgently required in connection with work to be done immediately. He noticed that the lens in question was an equally-double convex, so he sent immediately to the sole shop in his locality in which such things were sold and procured several reading-glasses as near the focus required (ten inches) as possible. One of them happened to suit exactly, and upon trying to take a picture he and his assistants found it somewhat difficult to distinguish between the work of the lens in its original state and after it had received its novel back lens, which cost only three shillings.——There is nothing specially wonderful in this. Several years since some of our best makers constructed their portrait combinations with a crown back lens with equally-double convex surfaces; and we can readily understand how the lens of a reading-glass would make a passable substitute for such a lens provided it were of the same focus, and it happens that many reading-glasses are of this focus.

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South London Photographic Society.—At the next meeting of this Society, on Thursday next, March 1st, at the Rooms of the Society of Arts, Adelphi, a paper will be read by Mr. Peter Mawdsley on *The Collodio-Bromide Emulsion: Some of its Applications.*

Photography in Court.—At the Clerkenwell County Court, on Saturday last, the 17th instant, the case of Syrus *v.* Laws came on for hearing before Mr. Gordon Whitbread. Mr. Napoleon Syrus sued the defendant, a watchmaker, to recover the sum of six shillings and sixpence, under the following circumstances:—It appeared from the statement of Mr. James Popham, solicitor for the plaintiff, that the defendant was a member of a portrait club, and in accordance with the regulations of the club he had paid his subscriptions regularly and had received twelve *cartes de visite* and one enlarged portrait for the money he had paid. The defendant being dissatisfied with the colouring of the enlarged photograph asked the plaintiff if he would colour him a second one, which the latter agreed to do if the defendant would pay him six shillings and sixpence more for doing so, which the defendant agreed to do. The portrait was sent home, but as the defendant denied further liability the present action was brought to recover the sum claimed. The plaintiff produced the portraits in court. The defendant stated that, not being satisfied with the first, the plaintiff promised to colour a second one for nothing, as he had been instrumental in introducing several members to the plaintiff's club. The judge, considering the defendant had entered into a contract with the plaintiff, and as it was unreasonable to suppose that any professional man would work for nothing, said he should give judgment in favour of the plaintiff for the full amount claimed, with costs, more particularly as he saw no fault with the first portrait as a work of art.

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METEOROLOGICAL REPORT,

Observations taken at 406, Strand, by J. H. Steward, Optician.

For the Week ending February 21, 1877.

These Observations are Taken at 8 a.m.

Feb.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks.
15	29·97	WSW	49	50	52	47	Dull
16	29·81	WNW	41	43	51	41	Cloudy
17	29·98	NW	41	44	50	40	Cloudy
19	29·92	W	42	43	48	41	Dull
20	29·14	NW	38	40	46	37	Stormy
21	29·77	W	35	39	44	36	Cloudy

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 878. Vol. XXIV.—MARCH 2, 1877.

THE RESTORATION OF FADED PHOTOGRAPHS.

It would be needless to waste the time of our readers or ourselves by indulging in well-worn platitudes respecting the fading of silver prints, or in lachrymation over a generally-admitted fact. Photographs *do* fade; that is the text on which we purpose making a few remarks of an exceedingly practical character, and these remarks will have to do rather with the cure than with the cause of the disease. Accordingly we at present place on one side all the many excellent things that could very easily be said as regards the adoption of processes in which silver salts have no part, and of suggestions by which, if silver printing *be* adopted, no deleterious substance antagonistic to permanency shall be left in the paper, and plunge at once *in medias res.* While admitting to the full the existence of the disease, our observations will ignore the preventive, and have reference only to the remedy.

In our number for last week, in replying to the query of a correspondent in the page mainly devoted to direct and semi-private intercourse between readers and Editors, we had occasion to inform our querist that we had repeatedly restored faded prints by what we may here, adopting medical nomenclature, designate "mercurial treatment." Numerous sharp eyes must have scanned this portion of our Journal, if the letters, arising out of that simple notice, which we have received be any criterion; for, since its appearance, every mail has added to the requests already received that we would devote an article to giving simple and practical directions by which our readers might be enabled to recover, even if only to a partial extent, their faded silver prints.

Given, then, a faded print, by what means can it be restored? It is now, we imagine, about twenty years since Mr. J. G. Tunny in our hearing suggested to the members of the long extinct Photographic Society of Scotland a means of strengthening prints which had partially faded, by immersing them in a strongly acidified solution of gallo-nitrate of silver. This method, however, was applicable only to the strengthening of the dark portions of prints which had faded from exposure to atmospheric influences, but did not apply to the sadly-degraded condition of the whites of such pictures. We need scarcely observe that in the fading of an albumenised print the whites are the first to suffer change. They become of a disagreeable yellow colour, with which, more or less rapidly, assimilate the delicate demi-tints of the picture, the blacks acquiring a peculiar colour which may be represented by the compound term "sooty-metallic-black." In the course of time this black becomes changed into a greenish-brown tint which rapidly becomes lighter, the whites all the time becoming darker and in more close assimilation to this tone.

Let us now assume that prints which have undergone fading to the extent above described are to be subjected to remedial treatment. The first thing to be done is to effect their removal from the mounts. The best way of doing this is to immerse them for a few minutes in warm water. When the severance of the prints from the mounts has been effected it is necessary to wash the backs so as to ensure the removal of any paste or glue which may be adherent. We urge this point somewhat strongly, because, on one occasion, when we operated upon prints from which the paste had not been properly removed, we found the process of restoration proceeding unequally.

The next step is to remove the photographs from the vessel of warm water in which they have been placed after cleansing their backs, and transfer them to one containing a solution of bichloride of mercury. The way in which we made this solution was to pour a small quantity of boiling water upon as much of the salt as we judged to be necessary to saturate the water to be used; for the bichloride, although sparingly soluble in cold water (one to about sixteen parts) is dissolved in hot water in the proportion of one to three parts. The best way, therefore, to make a bath of working strength is to make a saturated solution in a small quantity of hot water, and add to this cold water to make up to the desired quantity.

While speaking of the solubility of bichloride of mercury, we may observe that it does not appear to be generally known that this salt is extremely soluble in ether, the knowledge of which fact may be useful to those who at any time require a concentrated solution for any purpose, or who desire to make an aqueous solution without loss of time, which may be effected by adding to water a few drops of the ethereal solution. We do not here lose sight of the fact that the salt is also very soluble in hydrochloric acid and in strong solutions of various salts.

After a picture has been immersed in this restoring bath for a few seconds (and we recommend that it be done in daylight, not with candle-light) the yellow, dingy colour of the whites will be found to disappear, giving place to the original pure white of the albumenised paper. The details of the print are next seen to undergo a change, the dark shadows becoming of a warm violet-brown, the sooty blackness being entirely displaced. When the proper effect has been produced, the print is lifted out of the solution by means of a pair of horn pincers, or by a glass rod, and immediately transferred to a vessel of water. The remaining prints are treated one after another in a similar manner; and when the restoring operation has been completed the fresh, pure, ruddy appearance of the prints will be in striking contrast with the sickly, faded appearance by which they were previously characterised.

During the present week we have subjected several old prints to the treatment here described, and in every instance with a manifest improvement. We have also examined some old and faded prints which we restored in 1865, and find that after a lapse of twelve years they are nearly, if not quite, as fresh as they were immediately after undergoing the restorative treatment.

SOMETHING MORE ABOUT PYROXYLINE FOR EMULSION WORK.

In the course of photographic practice we frequently encounter apparent discrepancies in the results obtained and in the behaviour of the preparations, which are at first sight, to say the least, puzzling. In this class we may now consider the preparation of pyroxyline suitable for washed emulsion purposes, which it would appear from recent experience should be of a directly opposite character to that usually employed in emulsion work. Recognising in the earliest days of washed emulsions the important part played by the pyroxyline, photographers were not slow to endeavour in every possible manner to improve its quality and applicability to the special purpose in view; but, strange to say, one and all appear, by the light of our present knowledge, to have erred in seeking to render the cotton as powdery and organic as possible.

We have, on more than one occasion, given reasons why an extremely powdery and soluble cotton is not to be recommended where the emulsion is to be subjected to the process of washing, and Mr. H. B. Berkeley last week states that he has succeeded in greatly increasing the sensitiveness of his preparation by discarding the use of any specially-made organic cotton. The credit of first pointing out this difference between the cotton required in the washed and ordinary emulsion processes is, however, due to Mr. H. Houlgrave, of the Liverpool Amateur Photographic Association, who, within a few months of the first publication of the details of the pellicle process, stated publicly the advantage to be gained by the use of a "horny" or "skinny" collodion. That is the true solution of the question, and not the presence or absence of organic compounds capable of combining with the silver salts; but it usually happens that the formula which gives the most organic cotton reduces it to the powdery state, while, unless a special course be adopted in its preparation, a skinny collodion is almost devoid of organic reaction.

We may here give, for the benefit of those of our readers who have not studied this subject, the cause, or rather supposed cause, of this great difference in behaviour of two emulsions which ought apparently to be identical in action as they are in composition. Doubtless the first intention in forming a pellicle was to produce a dried product identical in properties with a dry-plate film, but in the more convenient form; and, in securing this result by the treatment of a large quantity of collodion or emulsion in exactly the same manner as that film is prepared, the conditions are *almost* adhered to. The slight departure from the requisite conditions is more in a physical than a chemical direction, and consists in the presence of a much larger proportion of unevaporated solvents during the earlier stages of the washing. It is practically impossible to avoid this difference; for, in evaporating a layer of emulsion of considerable thickness, the surface sets and becomes leathery before the under portions solidify, the skin which forms enclosing and preventing the evaporation of the remaining solvents. The consequence of this is that when the water is poured on, and gradually mixes with the remaining ether and alcohol, a large proportion of the valuable organic compound is removed by diffusion as well as the more soluble portions of the pyroxyline, and thus the character of the pellicle becomes entirely different from the original emulsion.

If, on the other hand, a sufficient time be allowed for the whole thickness of the pellicle to become sufficiently firm, the surface portion is found to be so hard and leathery as to resist completely the action of the washing water, and, after drying, is almost insoluble. If any doubt exist as to the presence of ether and alcohol in the semi-dried pellicle when apparently quite set, a cursory glance at the surface of the water when the mass is cut into will at once convince; for the moment the hard crust is broken, and an outlet made for the volatile solvents, the latter rush out and mingle with the water, causing sufficient disturbance to render the diffusion plainly visible, and any floating particles of pellicle are whirled about in a most violent manner. By the addition of a small quantity of pure glycerine to the sensitised emulsion previous to pouring it out it is possible to allow a much larger proportion of the solvents to volatilise without hardening the pellicle too much, the glycerine keeping the pores open; but this effect is limited by the extent to which the emulsion will bear such addition.

We have no doubt that this action, in connection with different descriptions of pyroxyline, will explain, to a very great extent, the very discrepant results obtained by various workers in this process, and also the different rules of working laid down by them as regards the best method of treating the pellicle. Thus it has been variously recommended to allow the pellicle to set thoroughly, and, on the other hand, to pour on the water as soon as the surface becomes firm. Glycerine is added by some workers with beneficial effect, whilst others assert that it is injurious. We think it extremely probable that these discrepancies are due entirely to the different kinds of pyroxyline employed, no two samples made by different formulæ being alike in all their characteristics. It is easy to prepare a number of samples which, while nearly equal in organic reactions, vary greatly in solubility, body, and toughness, and which, though equally good when used in the ordinary collodio-bromide emulsion, give strangely unequal results after washing.

In order to put this theory to the test we have quite recently made a series of comparative trials with emulsions made from widely-different samples of cotton, and treated, as far as possible, in a similar manner in each case. The outcome of these experiments is rather remarkable; for we find that the so-called "high-temperature cottons," considered so essential to success in emulsion work, are decidedly inferior when converted into pellicle to an ordinary sample suitable for wet collodion, while the best result of all appears to be obtainable with a pyroxyline giving a very indifferent image in any other process. Such a pyroxyline is more easily manufactured and is cheaper than the high temperature, and presents no difficulties to amateurs who choose to make their own; so that, while we have been carefully devising means to improve the quality of our emulsions by increasing the difficulties surrounding their preparation, the better course would seem to be in the direction of greater simplicity.

Another branch of experiment has been the improvement of the emulsion by rendering it less amenable to the action of water during its washing—a brief account of which may be useful to those of our readers who happen to have a stock of materials on hand. We have not worked out this branch to its full extent, our experiments having been confined to the use of two or three substances added to the collodion previous to sensitising for the sole purpose of increasing its toughness. Two of these substances are castor oil and Canada balsam, both of which are known to perform that function, and have proved of great use in making transfer collodion. For our purpose, however, they must be used much more sparingly, or the effect will be to render the pellicle quite impervious to water. We have used them considerably diluted with ether, adding one drop or more, as necessary, to each ounce of collodion.

The effect of such addition when made to a collodion giving a very powdery film is to increase its tenacity, and samples of cotton which require the greatest care in washing under ordinary circumstances are wonderfully improved, both physically and chemically, under this treatment. Of the two we are inclined to prefer castor oil, as it is more uniform in its action and presents less danger of rendering the product impermeable, besides being more pleasant in use. The best remedy, however, is sulphuric acid, which may be used in two different ways—as an addition to the collodion or as a wash to the pellicle. In the former capacity it was first recommended for ordinary emulsion work by Colonel Stuart Wortley, who ascribes its beneficial action in increasing sensitiveness and giving density to the formation of sulphate of silver. We are, however, of opinion that the result is due to the action of the acid upon the collodion rather than upon the silver, as its advantages may be secured in the absence of all free silver. When applied in connection with a washed emulsion it entirely changes the character of the pellicle, and to such an extent is this true that Mr. M. Carey Lea's method of washing may be used when, under ordinary circumstances, it would be impossible.

The alternative mode consists in substituting for the first water used in washing sulphuric acid diluted with six or eight parts of water, and allowing the pellicle to soak for some little time. This appears to produce its effect by parchmentising the pyroxyline, and will be found by many the preferable plan. We may add that the addition of a small quantity of this acid to the first two or three changes of water will be found beneficial in most cases, as it prevents solution of the pellicle and gives body to the resulting emulsion.

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TRANSMITTING PHOTOGRAPHS BY TELEGRAPH.

From paragraphs in another page it will be seen that a French *savant* has proposed some method by which a photograph may be transmitted from one place to another by the agency of the telegraphic wire; but we have not yet been able to learn anything of the means proposed to be adopted for securing so desirable an end.

We are, however, in a position to give details of a method by which a photograph may be transmitted, with the "speed of thought," to any part of the world with which the sender is placed in electrical communication. But this transmission is subject to compliance with certain modifications by which the original character of the picture, as a photograph, must be slightly altered, although this alteration is not necessarily any greater than that to which it has to be subjected before it meets the eye of the public as an engraving in any of our illustrated periodicals.

Rather more than twenty years since Mr. F. C. Bakewell, the author of a well-known treatise on *Electric Science* and other philosophical works, invented what he termed "the copying telegraph." By means of this system the very handwriting of the person who wrote a message could be transmitted in *facsimile* to his correspondent, all errors in transmission being avoided owing to the fact of the message being traced by mechanical agency from the original document. To render clear our description of a method by which a photograph can be "telegraphed" it is necessary that we should give a brief account of Mr. Bakewell's clever invention.

Premising that paper can be prepared with certain chemicals (such as a solution of prussiate of potash and hydrochloric acid) which are decomposed by the passage of an electric current, the decomposition resulting in a visible mark at any or every place where a sharp point in the electric circuit is allowed to touch the paper, it will be readily comprehended that to bring such a sharp point in communication with the paper so prepared is a feat that can very easily be accomplished at a point distant thousands of miles. Mr. Bakewell's invention consisted in causing the communication to be written on tinfoil with an ink which was a non-conductor of electricity. The letters thus written formed on the surface of the metal a number of non-conducting marks. If, now, this sheet of tinfoil, previously trimmed to a definite size, be wrapped round a cylinder which will just suffice to permit of its going once round; if, further, this roller, placed in the electric circuit, be made to rotate at a definite rate of rapidity, and with a spiral or progressive motion from one end to the other in relation to a fixed point, it will be obvious that if this latter "point" be a needle mounted with sufficient elasticity to rise and fall as it passes over the heights and hollows of the letters which rotate underneath its point (which must be blunted so as not to scratch), a current of electricity will be transmitted to a distance which will be continuous only in the ratio of the immunity enjoyed by the ground, or tinfoil, from the breakages caused by the constant interruption of the non-conducting ink with which the message is written.

The drum or cylinder containing the communication being rotated, spirally, at one end of the telegraph wire, it now remains to be shown how the message is received at the other end. A cylinder, of precisely similar dimensions to that round which the communication is to be sent, must be ready at the receiving end of the wire, and round this must be wrapped a sheet of paper prepared in the way we have indicated. It, too, like the former cylinder, must be pressed upon with a needle-point tracer, and, like the original, it must also be made to rotate at a certain velocity previously determined upon, and, finally, it, too, must be made to move slowly from end to end, so that the point shall pass over it in a continuous line or spiral. It only now remains that, all things being ready, the clockwork be started, when the former roller will rotate under a point which is transmitting electricity subject to the interruptions caused by the letters of the message. As the paper on the receiving roller is travelling both in a circular and lateral direction at the same rate, it is evident that every touch of the tracer on the original communication will be rendered visible on the blank paper at the other end of the wire, the only difference being that, whereas the original communication is dark on a white ground, the message is received in light letters on a dark ground.

To transmit a photograph in accordance with the principle here laid down, it is first of all necessary that it be converted into lines. With our present knowledge of electrical communication we must not expect the electric current to discriminate between thick and thin non-conductors; and until this has been achieved, if it ever will be, graduated tints must remain in abeyance. To convert a photograph—a portrait, for example—into lines a print should be made on silver paper in the usual way, and this must be traced over with black ink, using a fine pen. When the tints have in this manner been translated into lines, the photograph is immersed in a diluted solution of bichloride of mercury in hydrochloride acid, by which the photographic image will disappear, leaving the pen-and-ink drawing only visible. If from this a negative be taken and a print in carbon be made upon a sheet of tinfoil, all the electrical conditions requisite for effecting the transmission of this drawing to any distance will have been complied with. The gelatine which forms the blacks, or lines, of the carbon print is a non-conductor; the base, on tinfoil, upon which the print has been developed, or to which it is permanently attached, is a conductor, and nothing else is required in order to effect the transmission of the picture in the manner we have described.

The accuracy of any likeness thus transmitted will depend upon two things:—First, the fidelity with which the artist who is employed to make the pen-and-ink tracing effects his work; and, secondly, the adoption of such means as will ensure both cylinders (the transmitting and receiving cylinders) rotating with a similar degree of speed—a matter involving no difficulty whatever.

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EMULSION PHOTOGRAPHY.

Since the reading of my paper before the South London Photographic Society on *The Collodio-Bromide Emulsion Process Applied to Transparencies, and Enlarging Without a Nitrate Bath,* the suggestive remarks contained in the articles by the Editors of this Journal, which have appeared since the meeting of the Society, call, I think, for a few remarks relative to many experiments that I have made before and since, and will not be out of place here.

With respect to making a stereoscopic transparency in the camera by using a pair of lenses, and making two exposures and shifting the negative to bring the halves of the picture in their proper position: I may say that I tried this years ago, but seldom could get a finished result that was presentable, never being able to get the two of equal depth and density, owing, I believe, to a peculiar action of the light sensibly affecting the second half of the picture; for, if both exposures were made exactly the same length of time, one half would always appear more exposed than the other. That is the reason for my preferring to cut the original negative; for at the present time it is of little consequence, there being so few, if any, paper prints required from stereoscopic negatives. I give this as my experience. Some may not have experienced the same difficulties in the separate halves of the picture not being alike when made by two exposures. I still, therefore, continue cutting the negatives and the use of one lens.

I am pleased to hear that the Editors have corroborated my experiments as regards the tone of the transparencies by the use of inorganic salts, such as the phosphate and acetate of soda. I did not introduce the results of my experiments respecting the use of organic agents, such as tannin, gallic acid, honey, &c., for the purpose of securing a pleasing tone in the transparency. I tried the addition of the substances I have just named by adding them in solution to the developer, but I always found them to give, more or less, an olive-greenish, unpleasant tone. However, since reading the Editors' remarks I have resumed my experiments in this direction—not by adding them to the developer, but in the following way (I am alluding to the use of a washed emulsion):—After the plate is coated with the emulsion it is immersed in either an aqueous or alcoholic solution of the above—either separate or mixed in different proportions—and set aside to dry in the ordinary way. The result is totally different than when added to the developer at the time of using; for, instead of getting the nasty, greenish hue, we now get pleasing warm tones of great beauty, but different to the pleasing tones given by the addition of the acetate and phosphate of soda.

I must also here mention that when the above organic salts—such as tannin, &c.—are used, the developer recommended by me will not answer in such case; it has to be the one known as the strong alkaline developer introduced by Colonel Stuart Wortley. I must not omit to mention that the ale preservative, as recommended by Canon Beechey, gives beautiful tones. It stands thus:—Ordinary ale, one ounce; pyrogallic acid, one grain. The plate is treated in the way I have already mentioned, and allowed to dry before it is exposed.

DEVELOPER.

P.

Pyro	96 grains.
Alcohol	1 ounce.

B.

Bromide of potassium	15 grains.
Water	1 ounce.

A.

Carbonate of ammonia	80 grains.
Water	1 ounce.

After the plate has been exposed common methylated spirit is poured over it and allowed to soak in for a minute or two; the plate is then washed until the water flows freely over its surface. The following is then applied:—

P	½ drachm.
B	40 minims.
A	2 drachms.

If fully exposed the image will make its appearance in about twenty seconds, very slowly. If it come up too quickly add a little more of B; if too slowly add a little more of A. The requisite density is easily gained by this method of developing, and different colours are produced according to the organic wash that is used and the length of exposure that has been given. It seems quite impossible to get warm tones with short exposures. It is very peculiar what different colours can be got by varying the length of exposure. For instance, by way of experiment, supposing in making a transparency by contact an exposure of one second is given. On developing a cold black tone is obtained; on a second plate being exposed for two seconds, and developed with the same developer, the result will be a bluish tone; a third plate with three seconds' exposure will give a greenish, a fourth plate with four seconds' exposure will give a greenish-yellow, while a fifth plate with a still longer exposure will give a more yellowish, tint. On still increasing the exposure we get the warmer red tones; and, further still, we get the more intense reds; while with a plate very much over-exposed we get a violet kind of red tint. Now, in noticing how these colours succeed one another, one will be struck with the fact that the colours follow out the order of the colours of the solar spectrum, or nearly so.

I may, perhaps, have not given the exposures correctly, but I have given them, to explain what I intend, as nearly as possible. All these colours I have obtained from one negative. It is not a bad effect, in subjects with all foliage, to obtain the green tone. It is more suitable than warm red tones would be for trees.

I must now call attention to another important fact. I have often seen it stated that many find it difficult to obtain sufficient density in negatives when using a washed emulsion. I myself have been troubled in this way at times; but it is now with me a thing of the past, and I have not yet found an emulsion that would not submit to the following treatment:—The plate is exposed as usual, wetted with alcohol, and well washed; it is then flooded with the ale preservative before mentioned, and drained slightly. The strong alkaline developer is now used, and by this means any amount of density can be obtained—quite intense enough for the reproduction of line engravings. While the development is more under control, as a rule with washed emulsion I have found they do not stand the strong alkaline developer, the shadow soon becoming veiled with fog; but not so when working by the system just described, for it seems almost a thing impossible to fog the plate.

There were many things I should like to have introduced into my paper read before the South London Photographic Society, but I thought it would take up too much time, and, being a dry subject, I believed there would be little interest taken in it. I was, however, agreeably surprised at the large attendance and the lengthy discussion which followed. I have been an emulsion experimentalist for nearly twelve years. The subject has too many ramifications to be treated fully at an ordinary meeting of a society; but I hope at some future time, if it be the wish of the members that I should do so, to resume it, for I think it is one well worthy of attention.

WILLIAM BROOKS.

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ON SUBSTITUTES FOR GLASS FOR DRY PLATES.

[A communication to the Liverpool Amateur Photographic Association.]

LIKE many others I have been searching for a medium or support for collodion films in place of the weighty and fragile glass. The suggestion made at our last meeting I have not been able to carry out, the requisite materials not being forthcoming. Mr. Warnerke's tissue is, I suppose, one of the best, if not the best, though I did not succeed with it myself; but, as our President observed a month ago when speaking on this subject, we cannot make it ourselves or adapt it to our own pet process.

I first tried gelatine, but the development of a collodion film on this is so risky and so uncertain that it was given up, though, thinking of it since, it is probable that if the gelatine was previously made insoluble this substance might turn out a valuable material for the purpose. Should any feel disposed to try, the easiest way is to prepare the film on glass and afterwards coat with gelatine and strip, or gelatine might be coated with emulsion, as suggested by the Rev. H. J. Palmer.

Next I tried paper, but from what I used (double transfer from the carbon process) the film could not be got away—a good thing, perhaps, if the paper itself did not get stained during development. The one I have now to introduce to you is iron, in that form known as ferrotype plate, smooth. In its favour we have lightness, durability, smoothness, and no reflection from a back surface, and against it opaqueness and flexibility, both of which are objectionable; but I hope to show how the objections can be overcome and its advantage utilised. My mode of using these plates is as follows:—Attach the metal to a glass plate, by means of a drop or two of any fluid, to keep it flat and taut; then coat in the usual manner with a washed emulsion. Perhaps it would be better to mention here that in all these experiments I have used Mawdsley's pellicle, but any emulsion or bath process can be employed. However, the plate, being dried and ready for use, can be at once placed in the dark slide and exposed, either alone, or before, or behind a glass plate, or backed by a piece of wood to keep it flat; for, necessarily, if springs be used direct they will curve the thin metal. For use in the changing-box perhaps the best way is to bind it at the back of a thin glass plate with a piece of gummed paper kept shaped and ready for the purpose. There is thus no possibility of sharp edges of glass or metal catching or hindering in any way the passage from box to slide. A slight frame of wood could easily be made of the thickness of glass, which would be better and save weight. Of course, if glass be used, a dozen plates would be sufficient on a long journey, as every night the change of the whole could be made without more than fifteen or twenty minutes' loss of time—not more, certainly, than is usually given for the same purpose with ordinary dry plates; while most of the precautions taken may be dispensed with, for there is no chance of breakage, and little of light getting in, even if wrapped up in a single piece of non-actinic paper or calico.

On the exposure of these plates I wish to lay most stress. If one be sure of the right exposure being given the development is an almost mechanical operation. Therefore, do not risk a wrong one. Use the actinometer and the rest is certain. I had one during last summer's trip, and, although carrying three makers' plates, not one was either under- or over-exposed when I trusted it.

Next comes the development. Attach the metal again to a flat support, moisten with alcohol, wash, and apply a five-grain solution of pyro. to every five drachms of pyro; add two drops of bromide of potassium (120 grains to the ounce), more or less according as the image has previously appeared, and reflow over. Add one drop of the strongest ammonia, then another drop or two of bromide, and another drop of ammonia. These, after a little application, will give the necessary density. Fix and wash.

When dry coat with a solution of gelatine, made as mentioned in THE BRITISH JOURNAL OF PHOTOGRAPHY of the 20th ult.; that is, soften in water, drain, and dissolve in alcohol. This enables one to get a dry film quickly. Any ordinary solution of gelatine will do as well, but takes longer in drying—one ounce to three of water, and (say, three drops of glycerine) to prevent brittleness. A cut with the knife being made at one corner the whole detaches itself at once, and we have a negative with which we can print from either side, or re-attach to glass, if preferred.

For this process the emulsion mentioned above has the objection that you cannot see with absolute certainty what detail or density you obtain; but I do not anticipate any difficulty on this point if the right exposure be given, and the use of the actinometer determines this. Also, other films, whether washed or preserved, may not have this doubt. Indeed, I remember that with Wortley's emulsion, for instance, you can judge of the development as well by reflected as by transmitted light; so that the opaqueness of the support in such a case would not be of the slightest importance. I may also mention that if expense be no object the alba metal plates can be used in place of the ordinary chocolate ferrotypes. Thus the development can be watched with ease; but the alba plates are costly.

I do not offer the above as a finished process. It is more a suggestion which I shall be glad if others more competent will adopt and experiment upon, and that in time for summer work. The great weight of glass we have to carry, the risk of breakage, and the dirt of backing are great drawbacks to a summer's out. My little camera and two double backs with four plates cannot weigh much more than half-a-pound, and would hardly be a hindrance to any, even if climbing the Matterhorn.

Another advantage of negatives thus obtained is the facility given for combination printing and for making panoramic views, two or more gelatine negatives being joined together without the slightest difficulty; or stereos. may be cut and transposed without danger. But I am in hopes of finding a better medium for the transfer of the film from the metal, as there is sometimes a possibility of the gelatine, if unevenly or too quickly dried, breaking away in parts. This, however, is not an insuperable difficulty, and can be overcome by slow drying and sufficient body. The transfer paper as used by Mr. Woodbury ought to be the best for this purpose. The price, too, is not much higher than the best glass, and the sheets can be used over and over again, care being taken not to bend or crease them. The transparencies shown are done by this method, namely, a group of ferns under-developed—the first I tried; another a fall, torn through haste. The little bridge, the third done, is perfect—perhaps too dense to most minds; but this was done with more ammonia than I have recommended.

Since writing the above I got some of the autotype temporary support (paper), hoping that this would act as a means of transferring the negative from the metal to glass. It will not; but, in the course of experiments, I find that the paper itself forms an excellent basis for the collodion. Stretching the paper while wet on a piece of glass smaller than itself, and turning the edges under, it can be coated, when dry, in the usual way with the greatest ease; it is then cut and placed for exposure between two thin glasses, or to save weight under glass, and backed by any lighter material. The development is effected as for ordinary plates, and the result can be watched as easily. When dry it can be waxed for use direct, or, if preferred—as in panoramic or stereoscopic views—transferred to glass by means of one coated with bichromated gelatine, the paper negative being "squeegeed" (if there be such a word) on to it after immersion of both in water for a minute. If the gelatinised plate be kept ready prepared this operation may be performed immediately after washing, if satisfactory. This must then be allowed to dry *thoroughly*, when the paper comes away easily; but the wax on the paper being soluble in ether and the shellac in alcohol, it may sometimes stick to the gelatine too tightly. In this case if the whole be immersed in alcohol for a while the shellac is softened, and the paper can be carefully peeled off. The negative must then be varnished. I pass round some done in this way.

To this method I see no objection. If a non-inverted image be required you have it on the waxed-paper; if this be of no consequence transfer to glass. I think, also, that this paper may be more strongly recommended for the gelatino-bromide process, though I have not tried it. Water here being only used, the substratums are not affected, and, remaining intact, will prevent the paper being stained or from sticking to the film.

I have, as I said before, in all the previous experiments worked only with a washed emulsion; but I hardly expect that the washing of ordinary films would have any damaging effect. What will stand development will surely stand the preliminary operations. You will notice that the samples shown vary much—some bad, some good. I have brought failures as well as successes, as there is more to be learnt from the former than the latter. Thus, one of *Furness Abbey* is torn by taking the paper off before being quite dry.

You will notice in some the brown colour of the ordinary negative; those have not been toned. The torn one just alluded to is toned by chloride of palladium, and the difference you will see is remarkable. There is also the duplicate of this one untransferred to glass, showing the paper stained. This was caused, not by the development, which left the paper perfectly white and clean, but by the toning salt, the paper holding the hypo. so strongly that the usual washing failed to eliminate it; thus the palladium was precipitated in the paper—stains resulting. It does not spoil the good effect of the transferred film, but it spoilt my bottle of toner. To avoid all evils I next used the palladium *before fixing*, and with a weaker solution. The result was satisfactory in every respect, the toning solution being quite uninjured and the print equally good.

I am afraid I have wandered a good deal in my remarks, but this has been written at various times as the ideas cropped up. I ought, perhaps, to have waited until better results had been produced; but I hurried rather that I might obtain the help and suggestions of those who are more able than myself to work out a new process. J. H. T. Ellerbeck.

NOTES ON PASSING EVENTS.

By a Peripatetic Photographer.

The Editors will, doubtless, bring down upon their devoted heads the anathemas of some of the profession by their impugning the honesty of this constituent portion of our fraternity, as they do in their greatly-needed article, in the last number, on the action of bronze powder on silver prints. Not only our judgment, but our very honesty, is questioned by the Editors; and for what? Simply because we have not been sufficiently versed in chemical lore to know that bronze powder plays "old gooseberry" with our prints. Sly—sly Messrs. Editors! you must have known for many long years of the weakness of *some* of our class for trusting not less to the glitter of the mount than to the merit of the picture for pleasing our customers, and yet you have abstained from sounding the alarm until the professional world gets into a state of fermentation about carbon, when, knowing that we cannot give up the glitter and show of bronze mounts—knowing, further, that for busines reasons, we cannot afford to have spotted and faded pictures going through the length and breadth of the land with our names attached—you now play the bronze trump card in the partially-masked expectation of driving us all pell-mell into carbon. But it won't do! Carbon may be all very well, and I admit that bronze will not produce any effect upon it; but neither will honest printers' ink produce any bad effect upon silver. If people are so foolish as to seek to impart a meretricious effect to their photographs by pressing bronze into their service, then, say I, *let* their pictures fade, and *let* their reputations be ruined, and even *let* them figure as defendants in a case of "photography in court," in which some of the long-suffering public may sue for damages for pictures which have faded from preventible causes. This is what it will eventually come to, and bronze-mount photographers should take warning in time.

Unkind Mr. Berkeley, to raise us all on the tenterhooks of expectation only to enable us to appreciate the blessedness of those who, expecting nothing, feel no disappointment! "I have succeeded at last," observes Mr. Berkeley, "in making a highly-sensitive washed emulsion by discarding the organic pyroxylines and substituting a good quality of the ordinary kind." Being one of those who highly appreciate the experimental labours of Mr. Berkeley, I not only would feel greatly indebted myself, but I could promise him the gratitude of numerous readers of this Journal, if he would publish a description of the method of proceedure by which he obtains such sensitiveness.

The South London Photographic Society is to be congratulated upon the excellent character of its last meeting. Everything facilitating the production of transparencies possesses great interest for photographers, and to this is doubtless due the large attendance at, and the exceptional interest taken in the proceedings of, the last meeting of this Society. Who that is endowed with a spark of enthusiasm does not highly appreciate the idea of being enabled to rival the far-famed Ferrier transparencies in tone, while far out-rivalling them in permanence? Surely this is a consummation devoutly to be wished, or, to put it more correctly, to be received with becoming thankfulness, now that the requisite information has been imparted.

I am not sufficiently sanguine to indulge in the hope that our portable cameras will ever be rendered much more portable than they are at present; but I do think that those who minister to the weaknesses, and cater for the support, of tourist photographers might do a great deal in the way of supplying a more convenient and portable camera-stand than any of those hitherto introduced. Portability and rigidity must be united. The former quality is highly desirable; the latter indispensable. A Manchester gentleman—Mr. Hooper, I believe—contributed in 1858 an excellent addition to our knowledge of camera-stands by the invention of what has been termed the "umbrella tripod stand." This, which is in use at the present time, consists of three metal tubes hinged to a top piece, each tube containing a rod which draws out and allows the opposite end to be re-inserted for a couple of inches, or as far as a shoulder will permit its doing so. When the handle is removed a screw is revealed which fits into the bottom of the camera. This stand is, unfortunately, very ricketty; it can, even under the most favourable circumstances, only be made use of when the camera is *very* small and light, while if a slight breeze of wind prevail it is affected by a tremor. The alpenstock stand, which packs up in the form of a round staff, is a further step in the right direction; but its great length is unfavourable to its adoption. What is wanted is a moderately thick stand of dimension similar to that of an ordinary walking-stick, for which it may be used, and of capacity sufficient to contain the material out of which to erect a light, rigid stand about five feet in height. Fame, at least, awaits the man who will invent and introduce such a stand as that here indicated.

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GELATINE EMULSIONS.—DIALYSIS *VERSUS* WASHING.

In a communication on the above subject, published in The British Journal of Photography of April 26, 1876, page 191, I drew attention to the fact that there was a substance in gelatine which was soluble in cold water, raising the question whether it was desirable to retain this in the finished emulsion, and whether its keeping qualities would in any way be affected by its retention.

The result of the following experiment would seem to indicate that its retention is undesirable, and that the keeping qualities of an emulsion *are* affected by it:—

On the 18th of January I made an emulsion with bromide of ammonium, and previous to pouring out to set added some glycerine. This I did with the view of preventing the adhesion of the solidified emulsion to the dish; it did not, however, answer the desired end. After washing, the emulsion was doubled in bulk; this was due, I think, to its ready absorption of water caused by the addition of glycerine. I divided the emulsion into two portions, A and B. A was retained as made, but to B some gelatine was added without any previous soaking or washing, in order that the soluble, glutinous portion might be retained in the emulsion. A few drops of a tincture of kino were also added as a preservative. This I now often use instead of catechu.

After the lapse of about three weeks this portion of the emulsion had begun to liquefy on one side of the bottle. On examination I found that a small fungus had formed in this part. Its action was allowed to continue, and at present the liquefaction has much increased. The emulsion, which was previously firm, has become a tremulous jelly, decomposition apparently progressing rapidly, although the emulsion is by no means offensive, but, on the contrary, remains quite sweet.

Now, to what can this decomposition be due? To the glycerine, the kino, or the soluble substance of the gelatine? Not to the glycerine, I think (if any should have been retained after washing), as the portion A, which was left as first made, remains quite sweet and gives not the least sign of liquefaction. Neither can I attribute it to the kino, as other emulsions, made last autumn and in January, and to which kino had been added, remain still sweet and firm. I can, therefore, only suppose that the decomposition is due to the soluble portion of the gelatine retained in the emulsion.

From this experiment it would seem that, to prevent liquefaction, the emulsion should be well washed to rid it of the soluble impurities of the gelatine, and that when it is intended to be kept the process of dialysis, by which these impurities are retained, should by all means be avoided. F. S. K.

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PHOTOGRAPHY FROM A HOLIDAY-MAKER'S POINT OF VIEW.

[A communication to the Photographic Society of Great Britain.]

I must ask you to bear in mind that I am writing not as a photographer but as a holiday-maker, and that the pictures I show tonight are not the results of photography so much as of holiday-making. My purpose is to put before those who can run away from their work for a week or a month into the country how much they may add to the pleasure of a tour by taking a little camera along with them; but, if they do so, let them never fail to remember one maxim—Their chief object being relaxation and enjoyment, nothing should ever be permitted to interfere with their personal pleasure and comfort.

I have heard holiday-makers make a good deal of fuss about altering pre-arranged plans. Nothing in my mind is more foolish, supposing you are limited by time and money, as to start upon a pleasure journey without some definite idea of what you are going to do; but, at the same time, if during your journey you perceive a method whereby you can improve your tour, then bear in mind that your sole end and aim is pleasure, and do not hesitate one moment about changing your plans, no matter what trouble they cost you to draw up. You have well earned your holiday; let nothing interfere with your enjoyment of it.

So far as I am concerned I have made most of my journeys on foot, and when it is borne in mind that I have a knapsack to carry it will be seen that my photographic apparatus must necessarily be a small one. Of course when it comes to rough glacier work the guide or bearer will carry most of your baggage; but a pedestrian always finds many rough journeys to be performed where a guide is either unobtainable or undesirable. You want to linger here or there, and go out of your way perhaps to see a view, fill up an hour or two in some pleasant neighbourhood, take a photograph occasionally, and, in fact, be your own master, which is certainly not the case when you are in the hands of a guide, so that there is no alternative, if you want to be thoroughly independent, but to carry your own *impedimenta.* Before I go any further I ought possibly to explain myself a little better. I wish it to be understood, for instance, that I do not expect you to go into ecstacies about my results. I myself have a very poor opinion of my photographs as photographs. Some of them are simply atrocious; others again are only bad. Nevertheless I am quite satified with them. They are to me very bright reminiscences of pleasant journeys I have made. But they will not bear much criticism. That panoramic view of the *Dolomites,* for example —and I may here remark by way of parenthesis that the Warnerke film lends itself wonderfully for panoramas—will be pronounced, I fear, as black as one's hat and lacking in detail. I admit it; the sun was shining all the time into my camera instead of upon the object. But I could not wait another fifteen or twenty hours, till it pleased the sun to turn round. So I did what I could, and that is the result.

Had I written this paper seven or eight years ago I should have had to enumerate a longer list of photographic requisites than I find now necessary for my work, and should have considered it incumbent on me, moreover, to have said something about the preparation of dry films; for no one for a moment could hope to practice wet-plate photography under the circumstances in which I am generally placed. In my various journeys I have made trial of many different kinds of films. My Norway pictures were taken upon the early Liverpool dry plates, and upon coffee films of my own preparing—such as I should describe as slow and sure. Mr. England's simple and effective collodio-albumen process has given me that Tyrol series, and Colonel Stuart Wortley's uranium plates, the clear films of which render them specially suited for enlargement, are shown in my Engadine and Yorkshire prints; and, finally, my sketches of the Dolomites were secured by the aid of the Warnerke film.

When carrying dry plates, however, even when I limited myself to three or four dozen films upon thin glass, I found it impossible to carry the whole stock and apparatus myself, and some of it always fell to the lot of my companion. It is surprising indeed how half-a-pound more or less tells upon a tired pedestrian on crossing a pass a thousand feet or so above the snow-line, or after a day's tramp across the Yorkshire moors. I am glad for my part that my days of journeying with dry plates are over; in future I shall carry nothing but a little five-inch camera and the Warnerke roller dark slide. Together they form a most serviceable equipment; they are carried, as you see, in two leather cases slung over the shoulder, their total weight being three and a-half pounds. A tripod, which is at the same time a serviceable alpine staff, and a small wide-angle lens of Dallmeyer's completes the outfit.

But it is not only in respect to weight that the Warnerke film and roller slide have an advantage over dry plates. Anyone who has practical experience of the plates and the film will acknowledge this. In the first place: in carrying dry plates your day's allowance, placed in the dark slides for use, may either prove too many or too few for your wants. Your provision for the day is four plates, we will say; in the morning you are very chary about exposing them, and the consequence is that towards evening you are left with one or two unexposed. Or, again: you use all your plates early in the morning, and have nothing wherewith to secure a picture in the after part of the day. With the roller slide you may expose in one day two, or twenty, plates, just as you please. Again: there is no changing of plates when you get home, and of all the tedious and distressing labours that a fagged-out pedestrian can be called upon to perform, while his comrades are in bed and asleep, that of unpacking and re-packing dry plates, dusting and labelling them, and putting them in or taking them out of the slides, is about the worst. It is often, too, difficult to secure a suitable place for the purpose; in Norway, I remember, I was very much put out on this account. I meant to change my plates as usual at night time, but found I had reckoned without mine host; to my dismay it was as light at midnight as it is in England on a summer's afternoon. With the roller dark slide such difficulties as these fall away altogether.

Although but little practice and experience are necessary in the production of such little pictures as I show this evening, the novice must not imagine that they are to be secured without some care and trouble. Three main points require particular attention:—Firstly, he must know how to compose a picture in his camera—a matter in which he will experience little difficulty, probably, if he can sketch or has some little knowledge of art matters; in the performance of this operation he must bear in mind the nature of the lens he is working with, and especially its greater or less tendency to exaggerate the foreground. Secondly, he must learn to focus correctly. Lastly, what is most important of all, he must master the difficulties of alkaline development.

It is indeed upon the development of his pictures that success or failure mainly rests, and it is due to my especial shortcomings in this respect that my pictures are as bad as they are. There is no short cut for beginners; they must patiently master the subject by practice. In the development of dry plates patience is the greatest essential, and the success that attended Mr. R. Manners Gordon as a dry-plate worker was, I believe, chiefly due to the circumstance that he sometimes devoted a whole day to develope and work up a couple of plates. H. Baden Pritchard, F.C.S.

(To be concluded in our next.)

FOREIGN NOTES AND NEWS.

Kurtz's Photo-Crayon Portraits.—Herr Mach on the Scientific Uses of the Stereoscope.—A Preparation for Paper Supports for Pictures Intended to be Transferred to Stone or Zinc.—An Improved Method of "Steeling" Copper Plates.

In the last number of the *Correspondenz* Herr Adolph Ott gives an account of a visit he paid, when in America, to Herr Kurtz's photographic establishment, in Madison-square, New York. In Herr Kurtz's reception-room all sorts of photographic portraits were represented—from the simple carbon or silver print to photographs worked up in black and white, porcelain enamels, photographs coloured in water-colours, pastel, oil, and crayons. The latter, which are the speciality of this house, were present in the greatest numbers, most of them being finished by Herr Kurtz himself. The change of tone produced by the fading of the photograph, which served as the foundation of the portrait in crayons, induced Herr Kurtz to eliminate it from the picture altogether, and to substitute a faint lichtdruck outline of the same colour as the crayon pencil. Some of these photo-crayons have found their way even to Berlin, where they have been much admired. In the photo-crayons the photograph is but a means to an end; but in his purely photographic productions Herr Kurtz makes as little use of retouching as possible, there being but two negative retouchers in all his large establishment—a sufficient proof that his is no negative manufactory.

In the same journal there is an article by Herr Mach on the *Scientific Uses of Photography and the Stereoscope*, in which he suggests a development of an idea of the late Sir David Brewster's. Some of our readers may remember having seen linear outlines of geometrical figures mounted so that the two dissimilar pictures, viewed through a stereoscope, formed one apparently solid, symmetrical figure. This, then, is the foundation upon which Herr Mach's idea for the improvement of photo-anatomical preparations is based, and he developes it as follows:—Suppose he wished to make an anatomical study of a human head, so far as we can understand Herr Mach would first take a photograph of the head A; then lay bare the muscles and take a second photograph, B; then inject the blood-vessels and take a third photograph, C; and, lastly, a fourth negative, D, showing the bones. These negatives, or transparencies prepared from them, he would then arrange in a stereoscope or with prisms, so that they should combine and form one image, showing the anatomical construction of the whole. At least, so far as we can understand it, this seems to be Herr Mach's project. If Herr Mach had proposed to make a series of progressive studies consisting of a stereoscopic negative of A, one of B, one of C, and one of D, in order that by looking through the stereoscope at each in turn the student might see the pictures in relief and so be able to carry away a better idea of the real form of the object than a flat picture could afford him, the idea might be pronounced good and feasible, although by no means new. But, as we apprehend it, his proposal seems as practicable as if one were to take a picture of the stonework outside of a house, then one of the wooden beams and joists, then a third of the interior partitions and rooms of the house, then a fourth of the furniture and inhabitants, and place them as transparencies, two pictures on one slide and two slides one behind the other, in a stereoscope, and on looking into the instrument expect to find an image in relief showing the structural and internal details of the house. Of course it is understood that of each pair of pictures one is taken from the point where the image for the right eye would be obtained for a proper stereoscopic slide, and the other from the left-eye point.

In an article in the *Archiv*, on *Photolithography and Lichtdruck in Russia*, Herr Gustav Re gives directions for preparing paper for transferring impressions to stone and zinc free from the common fault of the paper, when wet, stretching out so as no longer to correspond with the original. He recommends for this purpose good, raw, photographic paper, perfectly freed from resinous size by washing with a weak potassic lye, and then dried between sheets of blotting-paper; or the so-called Chinese paper may be used. A sheet of plate glass should be well polished, have a little talc powder dusted on and gently rubbed in, and then be coated with raw collodion. When the paper and glass plate are both dry, cut a piece of paper somewhat larger than the glass plate; float the former upon a warm solution of one part of gelatine, one of alcohol, and ten parts of water; then lay it smooth and flat upon the glass plate, so that a border projects beyond the glass on all four sides; bend down the edges and paste them firmly to the wrong side; coat the paper once more with the same solution, and, when dry, scrape it quite smooth. The well-dusted plate should again be coated with a carefully-filtered gelatine solution (which may be either stronger or weaker than that given above, as may best suit the negative to be copied). The plate should then be dried, and, when so prepared, may be kept a long time; indeed it is recommended that it be prepared some time before use. When a copy has been prepared the plate should be laid in a solution of one part of chromate of ammonium in twelve parts of water until the paper becomes yellow, beginning at the side next the glass. The adhering fluid should be removed by blotting-paper, and the plate dried at a temperature which should not exceed 20°. If sensitised with potassic chromate the temperature of the plate may be increased to 40° without injury. The exposure should be as short as possible, and is ended when the picture is slightly visible on the glass side. The best results are given by a negative which is clear in the shadows and opaque in the lights. By washing all the undecomposed chromic salt is removed from the picture film, and by the addition of hot water all the soluble gelatine also. The last warm washing should not be too much hurried, but should be thorough enough to free the pores of the paper from everything soluble. When the print is perfectly dry it is dipped into a bath consisting of one part of neutral tartrate of potassium and eight parts of water, and left there until the lights are saturated; from this bath the print is transferred to a second, consisting of one part of tartaric acid and ten parts of water, whence it is removed in a few minutes, the moisture removed with blotting-paper, and left to dry. It is now ready to be blackened; but before going on to this last operation the plate is held for a few minutes over a vessel of boiling water in order to moisten it slightly, and is then rolled with not too thin printing ink. If all the manipulations have been managed with the requisite care the print should appear under the roller with an extraordinary sharpness and purity that leaves all impressions upon paper far behind. Lastly, a knife is run round the edges of the print when dry, and it is raised from the glass and transferred in the usual manner to zinc or stone. The preparation with tartar is especially important in the case of large white surfaces containing little drawing, as it preserves them, and prevents them from becoming smeared.

In the *Polytechnicon Notizblatt* Professor Boettger speaks of a new iron salt for hardening copper plates intended for printing art etchings. He says that an uncommonly hard iron—indeed almost harder than steel—and on that account especially adapted for giving a thin, polished surface of iron to engraved copper printing plates, is thrown off by electricity from certain iron double salts. By using this iron one avoids the troublesome necessity of multiplying these plates galvanoplastically; and should, after long use, the plate become blackened or clogged up, the thin iron film may be removed with the greatest ease by muriatic acid, and renewed in a few seconds. Until now use has, almost without exception, been made for this so-called steeling of sulphate of suboxide of iron and ammonia, which was first so applied and warmly recommended by Professor Boettger. Some little time ago, however, he observed that an iron solution, prepared as follows, is even better adapted for this steeling process:—Dissolve ten grammes of ferrocyanide of potassium and twenty grammes of tartrate of sodium and potassium in 200 cubic centimetres of distilled water, and to that add a solution of three grammes of sulphate of iron oxide in fifty cubic centimetres of water. This produces a great precipitate of ferric ferrocyanide (Berlin blue). Now add in drops to the whole, stirring occasionally meanwhile with a glass rod, a solution of caustic soda until the blue precipitate disappears again, and a perfectly clear, slightly-yellowish fluid is obtained, which may at once be used for the steeling process in question.

PHOTOGRAPHY BY TELEGRAPH.

The London papers are devoting some attention to this subject. *The Daily Telegraph* of Wednesday has the following remarks:—Whether the criminal classes have gained or lost by the advance of science is a moot point; but as society is richer, more intelligent, and better able to direct undivided attention to its own ends than mere outlaws are, it may be taken for granted that facilities for detection have shot far ahead of opportunities for crime. Among the latest and worst enemies which science has elaborated for the confusion of the murderer or the thief are unquestionably electricity and photography. The telegraph has always been a terrible foe of the criminal, since it frequently more than made up for the lagging processes of evidence. Even thirty years ago and upwards this result was witnessed. John Tawell, the murdering quaker, little thought when, after his foul deed at Salthill, he was hurrying into London as fast as a Great Western train could carry him, that the tell-tale message which was to fix his doom actually passed him on the line, and provided the emissaries of the law's vengeance with the means of arresting him red-handed. But since those days electrical science has made astounding strides, and photography has come into being. While the one aids pursuit and detection the other provides conclusive evidence as to identity. Of late, it seems, science has made even further progress in this direction, for we are told that the Paris police have perfected a process by which the likeness of anyone exhibited at the prefecture can be reproduced at any other town where the proper apparatus is set up, by means of an electric communication. It is proposed to establish such an apparatus at all the chief frontier towns. Thus, not only will the authorities be able to telegraph that a particular crime has been committed, and that a particular person has been suspected, but they will "wire" his likeness also. This, we need hardly say, is a much more likely plan to "spot" the person wanted than the "hair dark, nose aquiline, lips thick, eyes hazel with a slight cast in the right one, brow low and heavy," besides the nervous walk, stutter in the speech, and other peculiarities that may be supposed to point out the embezzling clerk or the dishonest shopman. When the innovation has become general the old hue-and-cry notifications, which were but hazy and vague guides to portraiture at the best, will be wholly superseded, and each police-office will have its gallery of celebrities for use when needed. It is only to be hoped that the advance of photography as a fine art will keep pace with the extension of its uses. Many an unlucky man—and still more woman—has, after various sittings, had to lament that the *carte* presented to him or her was an excellent likeness—of somebody else. Thus it is conceivable that awkward mistakes might happen if the portrait of the criminal has been taken under circumstances which have thrown his most striking characteristics into shadow, or endowed him with a blemish, as, for instance, a palpable squint, which chances to be the crowning grace of some virtuous neighbour.

The *Morning Advertiser* observes:—If a most circumstantial report of a recent discovery by a French *savant* be not incorrect, it is now possible to transmit photographs by electric agency. Thus, given the requisite apparatus and a portrait—of a criminal, let us say, flying from justice—at London, and the operator would be able to print off on a prepared medium at Newcastle, we will assume, the *facsimile* of that fugitive's *carte.* Such wonderful things have been done by aid of electricity and photography severally that we really do not know why this wondrous result of their joint action should not be credited. Let the invention once be popnlarised and its utility will be immense. Written descriptions of missing individuals are, after all, but approximately accurate; and an ingenious swindler would soon make himself so to differ from his published particulars as to be practically unrecognisable. But it would be no easy task to successfully elude a scrutiny based on a copy of a recent photograph. How useful, again, would the invention be in commerce, to transmit the details of particular patterns or samples. And had it only been known when the Tichborne claimant first advanced his pretensions, the transmission of his photograph would probably have put a stop to the imposture in its earliest stages, and he would not have been encouraged even to return to this country. How additionally interesting, too, this new application of electrical photography may make the telegraphic columns of our journals! Side by side with the item of news will be a faithful representation of its most salient features. The latest despatch from the Cam and Isis might then be accompanied by portraits of the crews; the result of a contested election by the effigy of the successful candidate; an earthquake in a central American town by a representation of the ruins; and the cruise of a future *Challenger* by *facsimiles* of the organisms dredged up at various points of the voyage. How useful, too, it may prove for the protection of joint-stock company investors! If it be a silver mine that is to be floated, let the would-be shareholders demand electro-photographs of the lodes said to be so full of precious metal. If it be a foreign tramway company, let the intending visitors first secure a panoramic view of the country over which the line is to pass; and then they may judge of the feasibility of the proposed gradients for themselves. The new invention bids fair to be so generally useful, indeed, that we wish it speedy development.

Our Editorial Table.

The Portrait.

London: Provost and Co.

We have received the first two numbers of this new claimant for public patronage. Each contains a photograph, that in the first number being a group of the ambassadors of the six great powers who recently met in conference at Constantinople, the negative being taken by Abdulla, of that city. The second number contains an excellent portrait of Mr. William Black, the novelist, accompanied by a very humorous autobiography. The photographs are printed by the Woodbury process.

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Street Life in London. Part II.

London: Sampson Low and Co.

The second part of this monthly serial contains three photographs, these being respectively *Recruiting Sergeants at Westminster, Street Floods in Lambeth,* and *Public Disinfectors.* Both in the quality of the pictorial illustrations and in the value of the descriptive text this number is quite equal to its predecessor.

Meetings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

At a meeting of this Society, held on Tuesday evening, the 13th ult., the Secretary read the following

REPORT OF THE COUNCIL.

The proceedings of the Photographic Society of Great Britain for the past year have been characterised by a steady progress in the work which should be the real object of its existence, namely, the study and advancement of photographic art-science by individual thought and collective deliberation. At the same time it must not be overlooked that the state of transition which some branches of photography are now experiencing must of necessity prevent much of that investigation into its strictly scientific aspect which might otherwise be undertaken, and limits the probabilities of making new discoveries, which is the part of this Society to afford its members opportunities to discuss.

As an example of a branch in a state of transition we may instance the gradual departure from silver printing to the production of permanent photographs, which forces itself upon the attention of all who desire that "a thing of beauty should be a joy for ever." Such a change as this necessitates the individual photographer experimenting for himself in private, and hence he is not in a position to assist so much in the collective public work of a society, and thus it follows that the publication of new ideas, or any practical research, becomes vested in comparatively few workers. Your Council cannot but express how much they feel the Society is indebted to those members who have, during the past year, laid before them some very important and valuable discoveries and investigations; and, whilst stating this, they would still desire to remind any member who may have remarked anything that is new or different in his idea to what others have done—however small or apparently unimportant—that it almost becomes a duty to lay the same before his fellow-members, so that fresh minds may be stirred up thereby to new efforts of research.

To meet the necessities of the time, your Council have considered the advisability of devoting some of the usual monthly meetings to a simple *discussion* upon various known subjects, upon which a *paper*, being more formal, might be found not so well adapted or necessary. The value of such evenings consists in many persons being able to make observations, arising from their previous individual knowledge, which is difficult, if not almost impossible, to be done when a paper is read upon a new subject.

The experiment has already been tried upon one evening, and your Council have every reason to be gratified with the result; and to indulge in the hope that, when more properly understood, these discussions will become a most valuable phase of the Society's work.

Your Council must congratulate the Society upon the increased attendance which has taken place at all your meetings during the past year. The opportunity afforded for the inspection of the works of fine art in water colours, which adorn the walls of their present place of meeting, not only adds brilliancy to the gatherings, but, whilst affording examples of study, must greatly increase the pleasure of those present. Fourteen papers have been read before the Society since last February, at eight meetings (including this evening), as follow:—

1. *Further Researches Respecting the Influence of Various Bromides on the Collodion Emulsion.* By Leon Warnerke.
2. *Note on the Production of Antimony Photographs.* By John Spiller, F.C.S.
3. *On the Measurement of the Actinic Value of Sunlight.* By Captain Abney, R.E., F.R.S.
4. *On the Preparation of Sensitive Dry Pellicle from Collodion and from Gelatine.* By Colonel H. Stuart Wortley.
5. *Note on a Dry Plate, Exposed and Developed Fifteen Years after its Exposure.* By Wm. Brook (Retford).
6. *A Novel System of Producing Large Panoramic Negatives by Means of Ordinary Small Cameras and Lenses.* By Leon Warnerke.
7. *On Some New Facts in Support of Dr. Vogel's Colour Theory.* By Captain J. Waterhouse, F.R.A.S.
8. *Note on the New Nitrate of Lead and Ferridcyanide of Potassium Intensifier.* By Captain J. Waterhouse, F.R.A.S.
9. *Notes on a Tour in South of Italy.* By the Rev. W. A. Crofton Atkins.
10. *On Stereoscopic Botanical Subjects.* By F. H. Worsley Benison.
11. *On Photographic Operations in the Recent Artic Expedition.* By Captain Abney, R.E., F.R.S.
12. *A New and Simple Method of Working in the Field.* By Peter Mawdsley.
13. *Note on the Reticulation of the Film in Carbon Printing.* By H. Baden Pritchard, F.C.S.
14. *Photography from a Holiday-Maker's Point of View.* By H. Baden Pritchard, F.C.S.

And a discussion at one meeting upon *Carbon Printing.*

It is with feelings of regret that your Council feel called upon to record that the annual exhibition held during the past year was not so successful as might have been anticipated from the success attending the previous display, and, although it remained open for a longer period than any of the former exhibitions, the attendance was not in any way commensurate.

Your Council would also beg to remind the members of the Society that it is only by united strenuous efforts, in *annually* providing the various works for exhibition, that the progress of the art-science can be made known to the general public; and hence, when any particular falling of in the character and number of the works exhibited is made evident, every individual member must to some extent feel the reaction arising from the reduced interest shown by the outside world. But your Council will take into consideration the causes which have led to this want of success, and consider the best means of securing, amongst other things, an exhibition of a more international character in the coming season, and of enlisting in its support the practical aid of a wide circle of photographers.

The following analysis of the exhibitions, made again this year by the Assistant Secretary, is appended as a record of facts which become desirable and interesting, if only from a statistical point of view:—

"There were 78 exhibitors; of these 37 were members and 41 non-members.

"Of these 78 exhibitors 34 were from London and 44 from the country.

"Of the 37 members 17 were from London and 20 from the country.

"Of the 34 London exhibitors 17 were members and 17 were non-members.

"Of the 44 country exhibitors 20 were members and 24 were non-members.

"352 frames were hung. Of these 189 contained 407 separate pictures of landscapes, architecture, animals, and flowers; and 168 frames, containing 534 separate pictures of art-studies and portraits.

"Amongst the 352 frames, are included 53 containing enlargements, comprising 35 portraits and 18 landscapes and architectural subjects.

"In all, 941 separate photographs, besides 52 negatives and 40 transparencies."

In conclusion: your Council hope that the hearty co-operation of all the members of your Society will be given towards the advancement of both the scientific and art side of photography, and that the forthcoming year may be rich in valuable communications, so that the prestige of the Photographic Society of Great Britain may be worthily sustained.

The Treasurer then read his financial statement of the affairs of the Society, as follows:—

BALANCE SHEET OF THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN

For the Year Ending 31st December, 1876.

CASH ACCOUNT.

1876. Receipts.	£	s.	d.	1876. Payments.	£	s.	d.
To Balance	279	19	3	By General Expenses	69	14	8½
,, Entrance Fees and Subscriptions	211	1	0	,, *Soirée* Expenses at the opening and close of Exhibition	37	19	2
,, Sale of Journals, Advertisements, and Sale of old Journals	51	3	8	,, Journal Account and Under-Secretary's Salary	134	14	0
,, Admission to Exhibition and Sale of Catalogues	87	17	3	,, Expenses of Exhibition	136	3	9
,, Balance of Petty Cash Account—R. J. Friswell	1	16	3	,, Balance	253	5	9½
	£631	17	5		£631	17	5

ASSETS AND LIABILITIES.

1876. Assets.				£	s.	d.	1876. Liabilities.	£	s.	d.
Entrance Fees and Subscriptions due	£139	13	0				General outstanding Expenses, say	6	5	0
Say less 30 per cent.	41	17	11				Balance in favour of the Society	406	12	11½
				97	15	1				
Advertisements outstanding				45	9	0				
Furniture, China, and Cost				16	8	1				
Cash Balance				253	5	9½				
				£412	17	11½		£412	17	11½

Audited and found to be correct,
(Signed) ROBERT MURRAY, F. BEASLEY, Jun., } Auditors.

February 9, 1877.

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LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The monthly meeting of this Association was held on Thursday evening, the 22nd ult., at the Free Library, William Brown-street,—the Rev. H. J. Palmer, President, in the chair.

The minutes of the previous meeting were read and confirmed, and Mr. T. Moore was elected a member of the Association.

Notice was given of the intended international exhibition of photographs in September next, organised by the union of Amsterdam photographers.

Mr. J. H. T. Ellerbeck then read a paper *On Substitutes for Glass for Dry Plates*. [See page 100.] The paper was illustrated by films taken by the methods Mr. Ellerbeck had tried.

The Chairman also exhibited a negative film which had been produced by gelatine emulsion on a gelatine support. He (the Chairman) stated that for small plates gelatine supports seemed to do very well, but for large plates he had found a difficulty in preventing cockling.

Mr. Ellerbeck said that in using the autotype flexible support that did not occur in working with collodion emulsion, but he intended making further experiments.

A discussion then followed as to the most suitable supports for films.

Mr. Wilson suggested paper coated with india-rubber dissolved in benzole.

Mr. Phipps thought that if albumenised paper was coagulated it would be found available.

The methods of Mr. Woodbury and Mr. Warnerke were discussed, but as the papers used by them were not always to be obtained it was considered advisable to contine experiments on the subject.

A copy of the *Rivista Fotographica Universale*, presented by Cav. A. Montagna, of Mesagne, which was illustrated by an excellent specimen of photo-polychrome, was handed round, and a vote of thanks was passed to M. Montagna. A vote of thanks was also passed to Mr. Ellerbeck for his paper.

The Chairman exhibited an album of photographs containing several productions of the London Amateur Photographic Association.

Mr. E. Roberts showed some fine stereo. transparencies obtained by the coffee process, which were greatly admired.

The meeting was then adjourned until March.

GLASGOW PHOTOGRAPHIC ASSOCIATION.

A meeting of this Association was held on Tuesday, the 13th ult.,—Mr. John Urie, in the chair. Five new members were admitted.

The following questions were taken from the box:—

"How may the same person be represented in two positions on a negative?" It was explained that a black curtain required to be hung in front of the lens covering one half while the first exposure was given; then the person was posed again and the curtain also shifted, a second exposure being then given.

"How may a large porcelain bath that had been broken be cemented and made useful?" White lac was recommended. Isinglass dissolved in acetic acid was also said to make a good cement for crystal, &c. Albumen and slacked lime were spoken of as likely to suit such a purpose.

There being no paper, the meeting was occupied in a conversational way with various subjects.

The Chairman gave an interesting sketch of how he became a photographer. His profession was that of a wood engraver, and he saw that the new art was likely to be of great assistance to him, so he commenced its study and practice, one thing leading to another. In making numerous experiments to discover the best method by which to produce pictures on the wood block which the engraver could work upon at once, he found that it consisted in coating the wood with albumen, then applying blacklead, rubbing well in and polishing, coating with thin collodion, sensitising in a flat bath, exposing in the camera, developing, and fixing. In this way he secured a picture suitable for his purpose. He (the Chairman) proceeded to detail some of his experience in daguerreotyping. He had worked in the usual way for a considerable period, when he got an operator from America who introduced several compounds which were found of great advantage. One was the revolving buffer instead of the flat hand one for polishing the plates; this saved a great deal of time and labour. The iodising boxes were used much deeper, the coating was much more regular, and the results more perfect than by the shallower boxes generally used in Britain.

Some of the members thought it would be very interesting to see the process gone through at one of the meetings.

The Chairman said all his apparatus had been destroyed.

The Secretary made some remarks on the large stores of photographic knowledge to be found in the back volumes of photographic journals, which latter ought to be carefully kept and frequently consulted. He thought there was one thing to be regretted. The journals had been looked upon as newspapers; but they should also be books of reference, and to make them easily referred to the indexes ought to be complete and systematic. Each article should be entered under a special heading—say optics, chemistry, collodion process, and such like. Every editorial article should have its name; every letter from correspondents should have a word to show what it was about; and even "answers to correspondents" ought to show what the answer referred to. At present the name to articles were a kind of epitome of the article itself, and when they wanted to consult a volume or volumes on any one subject there was a great difficulty in finding what was wanted. Suppose it was wished to read up on emulsion processes: they did not find it in the index under the letter E, but they might get something on this subject under every letter of the alphabet. There are (he continued) a great number of articles which have no heading of any kind; these often contain very useful hints, and if you want to refer to these some months or years after it is almost impossible to find the place. These back volumes are very useful to consult on processes that have been forgotten or neglected, and questions relating to patents may be answered by such consultation. But for young men studying the history of the art-science and past experience of the workers, it is evident these volumes will be of great use. But it may be said "we cannot have indexes made for old volumes now." True, but if there has been a defect in the past it would be well to have it rectified for the future.

Several of the members concurred in the remarks of the Secretary, and thought it right that some attention should be given to the matter.

A 15 × 12 direct picture—a group of two—taken eleven years ago in the open air, with sunlight effects, was examined and favourably criticised.

This concluded the business of the evening, and the meeting was adjourned.

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Correspondence.

More Experiments with the Violet Light.—Platinotype Process of Mr. W. Willis, Jun.—M. Leon Vidal's Establishment.—New Photographic Journals.—Progress of the Paris Exhibition of 1878.

On the 21st. inst. I received the following letter from M. Joliot, successor of M. Lejeune, the well-known Parisian photographer:—

"Dear Sir,—M. Scotellari intends to come to my studio on Sunday morning next, at half-past nine, in order to make fresh experiments with the violet-coloured light, which he proposes instead of white for photographic studios. These experiments are renewed in consequence of my defying him to prove that his system is better than the natural and ordinary one with white glass. This is, therefore, a personal discussion between him and me, but which, nevertheless, interests all the photographic fraternity, and this is the reason for my asking you to be so good as to be present next Sunday. The results which will be obtained will be perfectly convincing this time, because before I permitted the glass roof and side light of the half of my studio to be painted violet we compared the rapidity of the two halves, and they were found to be nearly precisely equal by M. Scotellari and myself. If, therefore, the violet light gives better results next Sunday it will be really and truly to it alone that the honour must be given. If you know any photographers desirous to assist at these experiments you would oblige me by inviting them to accompany you. Hoping that you will do me the honour to come next Sunday, if your other engagements permit, I have, &c., &c., (Signed) L. Joliot."

In the hope that something would arise interesting to the readers of The British Journal of Photography I went, as invited, and had the pleasure of being accompanied by Messrs. Downey, photographers to Her Majesty, who are paying a visit to the continent.

Nearly all the most influential men connected with the photographic profession were present. The *séance* was opened by exposing a plate (M. Scotellari being the sitter). Fifteen seconds were given in the white half of the studio and the same time allowed in the violet half. The negatives, on being developed in an uniform manner, gave a slight advantage in favour of the violet light; but in consequence of a remark made by M. Joliot, to the effect that the difference might be attributed to the fact that the proof made in the violet light was upon the thicker end of the pellicle of collodion, another plate was exposed under the same conditions, with the exception that this time the image made by the violet light was upon the thin end of the collodion. The two proofs, after development, were identically alike; therefore it was unanimously agreed that for an equal exposure a slight, but very slight, advantage was in favour of the violet light.

A very animated discussion then took place as to how the next experiment should be conducted. An honourable colleague wished it to be done in the same manner as at M. Gillies' studio, in which, it appears, the violet light bore off the palm. I objected to this, as the two studios were not placed under similar conditions, and proposed that as it had been proved that morning that a good picture could be made in white light in fifteen seconds, seven and a-half seconds should only be given with the violet light, which would be in accordance with the statements of the inventor himself, as he says—"My system diminishes by one-half the time of exposure." My proposition was accepted. The results were completely in favour of the white light.

The following were the experiments made:—

	Violet Light.		White Light.	
1st	15 seconds	....	15 seconds.	
2nd	7½ ,,	....	15 ,,	In favour of the white light.
3rd	8 ,,	....	16 ,,	
4th	6 ,,	....	9 ,,	
5th	9 ,,	....	6 ,,	

The last was certainly favourable to the violet light, but it had three seconds more of exposure than the white light.

It must be concluded from the above experiments that the violet rays, as proposed and arranged by M. Scotellari, do not accelerate the actinic action, and that the important *desideratum*, viz., the great abbreviation of exposure, has not yet been secured by that process. It must, however, be acknowledged that the system does not appear to retard the chemical action; but the advantage is so little—if advantage it can be called—that, with the expense to be borne, "*Le jeu ne vaut pas la chandelle.*"

Another experiment was then made with the kind of tunnel I had proposed to M. Scotellari, and mentioned in No. 875, page 69, of the Journal. Mr. Downey was asked to sit. Frames of white glass were put in, and the sitter exposed for seven seconds. The white glass frames were taken out and violet glass frames substituted. The exposure was the same (seven seconds). The advantage lay with the white light, the image being on the thicker part of the collodion. Another negative was then taken, and the results were about equal; in fact, the results obtained were in all wholly unfavourable to the inventor.

Would it be presumptuous on my part still to believe that ere long something good will come of this idea? Would it be strange to have condemned the idea all the time, and still to have the firm conviction that there is something valuable in it? Would it not be surprising to say that the inventor himself does not know in what consists the value of the violet light, and how he is to use it to the best advantage? Would it not be extraordinary for me to say that I believe that all the experiments which have been made by the inventor and others have been conducted upon a wrong basis? My reason for holding this opinion is that M. Scotellari, as well as all those who have experimented upon it, have employed transmitted light.

Mr. Gaffield, as well as a gentleman who signs himself "R. Y. C." (see The British Journal of Photography, No. 876, page 78), did the same. Now the experiments of my esteemed friend Mr. Gaffield I have always considered as very convincing, being made under his own control and in a very satisfactory manner; moreover, I have always believed that violet rays had a cutting off or absorbing power. But surfaces of a violet colour reflect the maximum of the light which they receive, and I believe that if M. Scotellari had contented himself with only recommending the studio to be of a violet colour, as well as all the screens and even the side lights, he would have attained what he desires, viz., a diminution in the time of exposure. But he daubs over the glass of the studio a violet composition which cuts off a certain proportion of the chemical rays, and which the power of reflection of the different violet screens and surrounding objects cannot counteract, and thereby he neutralises the benefit which he might otherwise obtain.

I have not from the first advised any photographer to take out his white glass and put in violet; but what I would persuade him to do now is to employ violet-coloured shades and reflectors, with side blinds of the same colour, &c., but on no account to employ the violet light by transmission—only by reflection. This will not change the organisation of his studio nor cost very much to make a trial, while the results may be of a satisfactory character, and prove a boon to the photographic community at large.

In having a process for the shortening of exposure in the studio I am happy to say that the platinum printing process of Mr. W. Willis, Jun., is about to command great success in France. This process is for the shortening of exposure in printing positive portraits instead of in silver salts. The process has been worked successfully some time in England by the Albion Albumenising Company. The inventor came over to Paris last week, and made a very successful demonstration in my laboratory. All the chemicals required for the process were made, paper prepared, and prints obtained in the same day. The results were so convincing that the large house of Poulenc and Wittmann entered into negotiations with the inventor, and bought his patent for France.

The magnificent exhibition of M. Léon Vidal draws numbers of amateurs, artists, and photographers. It is surprising to see the results obtained by the energy of a man in so short a time. This branch of photographic industry, although newly created, bears upon it the stamp of success. The quantity of work executed is truly wonderful. Eight large Woodbury presses to make pictures 9 × 12 inches, with machinery, hydraulic presses, &c., have been newly established upon the premises. M. Vidal informs me, moreover, that he intends to work the platinotype process of Mr. Willis as soon as possible. Nevertheless, with all this business on hand, M. Vidal still finds time to devote some leisure to photographic literature. I have just received the third edition of his *Practical Treatise on Carbon Printing*, to which is added a description of the numerous methods of printing proofs by means of machinery. A very long chapter is also dedicated to photochromy. The book contains three fine proofs, a very fine photochromic image of the *Couronne du Sacre de Louis XV.*, from the Musée du Louvre, and two charming pictures in fatty ink. To those who practise carbon printing this book will be a great boon and a valuable acquisition.

I have received the two numbers of the *St. Louis Practical Photographer*—a new American photographic journal. I wish Mr. Fitzgibbon much success. In America—that large and magnificent country—there is room for all and liberty for everyone. Competition in journalism, as well as every other thing, causes emulation, and the public is always a gainer and science advanced if carried on in a courteous manner and without political or other prejudices.

New photographic journals are springing up in Paris. One which has existed three years is now gaining a very prominent position. It was, in fact, hardly known a short time ago. I speak of the *Journal de Photographie.*

The exhibition of 1878 is making great progress. I visited the works the other day, and was surprised and pleased to witness the progress that had been made in a short time. Le Champ de Mars looks like an immense beehive. If Germans hold back, let it be hoped that English photographers will gain their laurels in the forthcoming friendly struggle for fame. E. Stebbing, *Prof.*

3, *Place Breda, Paris, February* 27, 1877.

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BRONZE POWDER AS A CAUSE OF FADING.

To the Editors.

Gentlemen, — Some time ago, through the kindness of Mr. E Dunmore, I obtained a card mounted on the surface embellished with gold lettering. All the parts of the photograph corresponding with the gold lettering were perfectly bleached. Such a remarkable specimen of bronze fading tempted me naturally to investigate the cause. To do this the surface was moistened and the print unmounted. On the back of the print was found the blue impression of the letters. The letters on the mount had also become blue, and only partly retained the metallic lustre. The mounting medium in contact with the gold letters became insoluble, so that, while the moistened print was easily unmounted, the resistance in the letters was such that the paper was slightly torn. The blue colour and further analysis of mounts similarly printed in gold, kindly supplied to me by Mr. J. S. Hazard, satisfied me that the mischievous agent was copper.

The prevailing opinion being similar to that expressed in the last issue of The British Journal of Photography, I expected to find in sulphur the cause of the mischief, and in various salts of tin and other metals as a constituent part of bronze powder. However, further investigation satisfied me that bronze powder, used exactly as described in your Journal, is pure metallic copper or its alloys. The sample which I enclose does not contain any salt—as I proved by analysis—and is universally used by lithographic printers in gold.

A question arises—Where does the acid come from to form the blue salt of copper which acts on the silver print? In answering this question I am again at variance with the usually-received opinion, and, therefore, I timidly venture to suggest that it comes from the silver print.

If I am correct in this statement, pure gold powder will not be better than the present bronze powder. I have, already, certain indications that it is so, but I am waiting for the aid of time to make the action more palpable.—I am, yours, &c., L. Warnerke.

10, *Linden Grove, Peckham Rye, London, S.E.*,
February 26, 1877.

[The appearance described in the above letter certainly points to the presence of copper, which, however, was entirely absent in the case we reviewed last week. In addition to the bronze described in our previous article a preparation consisting of laminated Dutch oil is very much used. This is an alloy of copper, and is prepared of various shades in the state of thin foil, which latter is reduced to a fine powder by a very complicated process. This would amply account for the blue colour noticed by Mr. Warnerke. As regards the acid required to form the copper salt, we rather attribute it to the mounting material than to the print itself, though it is probable that in the presence of slight moisture ordinary atmospheric conditions would be sufficient to produce a like result.—Eds.]

"VISION PURPLE."

To the Editors.

Gentlemen,—In your issue of yesterday reference is made to a fact, discovered by myself, "of a photographic picture being depicted on the retina of the eye of a slaughtered animal of that which it last saw previous to death."

It was first made known by my trying to discover, through Dectective Thompson, of London, the murderer of a woman. Dr. Phipson took up the idea and expressed the same opinion. The matter was published in your contemporary, and I was much laughed at at the time; nevertheless I knew it was a "fact," and I left it to time to bear me out in my researches. It has done so, and I now hasten with pride to place my name on record as being the original discoverer.

There are other things equally as wonderful as this that I have discovered, but the world is hardly old enough to understand them, and so to avoid ridicule, as showered upon me in this case, I let them be.—I am, yours, &c., Wm. Harding Warner.

Denbigh, North Wales, February 24, 1877.

EMULSIONS.

To the Editors.

Gentlemen,—Those of your readers who have read my last two letters, and have a knowledge of chemistry, cannot have failed to see that I have been labouring under a confused idea of the "old" and "new" notations. Through the kindness of a correspondent I have been set right in this matter, and now understand that $Zn Br_2$ will combine with double as much silver nitrate as Zn Br, and that, therefore, the equivalent of silver nitrate must be doubled in working the equation.

I had omitted to notice that in your last two Almanacs you have given the "new" notation and weights. In my small way I have been accustomed to work from the "old" notation given in a former Almanac. For instance: I have always used the "old" equivalents of cadmium bromide, and thus used the single equivalent of silver nitrate.

I am sorry to have taken up space with useless matter—at least so far as your readers are concerned; however, they have been enabled to see the "strivings after truth" of a "simple photographer." I think this explanation is necessary to show that I have not made a practice of working experiments with faulty equivalents. Still there is one point I noted I should like to see explained:—The theoretical equivalent of zinc bromide, if one grain combine theoretically (according to Mr. Warnerke) with 1·59 grains of silver nitrate, would be 213·8 new notation, whereas, by the symbol $Zn Br_2$, the equivalent is 225·2.

As nearly as I can estimate this zinc oxide in my sample of bromide was only about ·5 per cent.—a quantity very much lower than I thought on viewing the flocculent precipitate. Am I right in saying that, in this case, only about ·1 grain of water would be produced from the zinc oxide contained in 100 grains of zinc bromide when treated with two equivalents of nitric acid? Also, that only ·776 grains of $H NO_3$ would be necessary for the reaction? If so, I need scarcely say that I did not think evil of so small a trace as *that;* but I had thought the *percentage* of impurity to be much higher than it is.

On further trial with the zinc collodion emulsion, which now works much cleaner than it did shortly after dissolving, I find that it is nearly equal to my gelatine emulsion in sensitiveness. I have not found, as yet, any advantage in keeping the emulsion with excess of silver for more than three days; sensitiveness does not appear to increase, and the plates are more foggy. I find, also, that the "riper" emulsion has some peculiar vagaries; the last trial plate I prepared with it expanded to a great extent on moistening it with the spirit previous to development, and, on drying, the film split up. I cannot say what is the cause, for the plates I prepared with the emulsion a few days ago were not affected in this way. Can a *washed* emulsion alter even in a few days?

I have made a first experiment in the direction indicated in my last letter—the addition of a pyroxyline extract to a gelatine emulsion. My results have not been favourable in any way. Both the emulsions (one with and one without the "extract") give plates which turn red or orange-coloured on development. This is no stain caused by a discoloured developer. Whether the incipient fog is caused by the too great heat employed combined with excess of silver, or by the methylated spirit used in presence of silver nitrate and heat, I cannot say. I know that methylated spirit can be used with excess of silver, if the emulsion be only kept just liquid, without inducing red fog.

If silver nitrate has, *per se*, a fogging action on silver bromide when unrestrained, and also, if gelatine, under ordinary circumstances, is a restrainer, it is possible that, when a certain heat is employed, that heat is able to overcome the restraining action of the gelatine. I think I must have overheated the emulsions, especially as the plates blister. They seem equally sensitive, but only one-fourth as sensitive as my other gelatine emulsions. The deposit of silver bromide in the zinc gelatine plates is very fine and transparent—the very opposite to that of the zinc collodion plates, which are very opaque, but of good quality. I shall make some more zinc gelatine emulsions for trial.

It appears that an alcoholic gelatine emulsion is capable of giving a far more even film after being kept for some time—a thing I had been led to expect at the time of making my experiments. I have prepared a film on plain glass which is quite passable—except near the edges, which are marked with lines—with an emulsion made nearly three months ago. The emulsion is perfectly good.—I am, yours, &c.,

Cotheridge Court, Worcester, Herbert B. Berkeley.
February 26, 1877.

To the Editors.

Gentlemen,—Mr. H. B. Berkeley, in his letter of last week, seems to doubt whether a collodion emulsion can be made as rapid as one prepared with gelatine.

You will remember that, a few years ago, Mr. R. M. Gordon undertook some crucial experiments to determine the comparative rapidity of wet and dry plates; and that he (see The British Journal of Photography, July 5, 1872, page 113) admitted that the wet process had to "succumb to the dry both in rapidity and quality." It appears that on that occasion the dry process was worked by Colonel Stuart Wortley and the wet process by Mr. Gordon himself.

I also find in The British Journal of Photography of March 8, 1872, a leading article, in which you also, having been present at a trial between wet and dry plates at Rosslyn House, gave the palm, after an exhaustive trial, to the dry plates. Again: in the Journal of July 4, 1873, you eulogise some instantaneous pictures taken on uranium dry plates at the great naval review, and, I believe, from the deck of a yacht.

I have not as yet heard of any instance in which gelatine plates have been fairly pitted against wet plates; and my own experience shows me that a gelatine plate is not necessarily superior in rapidity either to a wet plate or to one made with a rapid collodion emulsion according to Colonel Stuart Wortley's formula.—I am, yours, &c., Herbert Kerr.

11, *Charles Street, St. James's, S. W.*,
February 27, 1877.

EDINBURGH PHOTOGRAPHIC SOCIETY'S EXHIBITION.

To the Editors.

Gentlemen,—My attention has just been called to a paragraph in the "Answers to Correspondents" in last week's Journal, referring to certain articles having been returned from the late Edinburgh exhibition in "a deplorable state." At present I have only time to say that I know that those who had charge of the repacking will be able to show that all due care was exercised, and that the statement that an "official request," or request from any official, was made for any sum "to ensure the necessary care and attention" is simply untrue.—I am, yours, &c.,

Edinburgh, Feb. 28, 1877. John Nicol, *Exhibition Secretary.*

CARBON PRINTING.

To the Editors.

Gentlemen,—I could never have anticipated that the account of my poor experiment in tissue-making should have involved me in such a controversy. I cannot, of course, tell *who* my sister "Nemesis" may be; but if, indeed, she *be* an authority, I can only wonder at her remarkable modesty, which shrouds herself under the mantle of "the daughter of night."

My sister does not controvert one syllable of what I said in my first letter. I do not say but what "the whisk of the talc" facilitates my work; but I repeat what I said, and in which I am confirmed by Mr. Window's experience, *that it is not absolutely necessary.*

With regard to the use of collodion: doubtless Mr. Johnson used that material before Mr. Spencer, but M. Fargier used it some years before Mr. Johnson, and it was for a modification of Fargier's method of using it that Mr. Spencer suggested it to be used. Mr. Johnson truly pointed out that there was no originality in the use of the material, but Mr. Spencer did not say there was; and, moreover, Mr. Johnson carefully pointed out that there was no originality on the part of M. Fargier in the use of the other material he employed, namely, pigmented gelatine, which was very truly said by him to have been originated by M. Poitevin.

I need not trouble you further in this matter.—I am, yours, &c.,
February 27, 1877. ALCESTIS.

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EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale*, that being done at a small cost in our advertising pages. This portion of our columns is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

A rotary cabinet burnisher will be exchanged for a head-rest.—Address, J. KEENS, 192B, Mare-street, Hackney, E.

I will exchange a whole-plate square camera complete, in good condition, for a portable walking-stick tripod, or anything useful.—Address, D. M., 22, George-street, Oban, N.B.

Wanted, No. 3 cabinet lens, by Ross or Dallmeyer, in exchange for fifteen high-class proof engravings after Landseer and others, large, and well framed.—Address, T. HARDMAN, 38, Barker-street, Harpurhey, Manchester.

A new and complete 12 × 10 Kinnear camera offered for rectilinear or similar lens of about thirteen inches focus; and a Ross 8 × 5 C doublet offered for a 1B Dallmeyer *carte* lens. Difference adjusted.—Address, E. WRIGHT, Watchmaker, Northampton.

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ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

NOTICE.—Each correspondent is required to enclose his name and address although not necessarily for publication. Communications may, when thought desirable, appear under a *nom de plume* as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

W. H. F.—The letters shall be duly returned.

J. EDWARDS.—The crystals have been received; we shall dissolve them and see how they behave when in solution.

BOTHERED.—By far the quickest and best method of removing the impurity is to throw down the silver, wash it thoroughly, and redissolve it.

ROBERT TAYLOR.—We are unable in this column to give directions concerning the method of making a dark tent. In some of our former volumes various articles on this subject have been published, and to these we must, meanwhile, refer you.

GORGONZOLA.—We advise you not to have your stereoscope constructed according to the Wheatstone method, but adhere to that so long and well known as the refracting stereoscope, using as eyepieces a pair of achromatic lenses of about five inches in focus.

PHOTOGRAPHS OF THE POPE.—We understand that Messrs. Geo. Cooper and J. Tatham have been to Rome with a special view to photograph His Holiness. This portrait is to form one of a picture of the eminent men of the Vatican, which is to be executed by Mr. C. Harrison.

PRACTITIONER.—We have tried the emulsion, and find that the film is exceedingly hard and skinny. We obtained an excellent picture, but purpose making some further trials of it. The smell, however, is somewhat offensive, as if it contained a large proportion of methylated alcohol of a bad quality.

J. W. L. inquires "if the albumen-beer process of Capt. Abney, described in the volume for 1875, page 136, is suitable for cloud work, or if any other *dry* process is more suitable."——We reply:—The process named is well adapted for taking clouds, but the lens should be used with a large aperture so as to secure great rapidity in the exposure. But the possibility of photographing clouds is not confined to this process, as there are many others by which it can be done equally well.

J. S. FISHER.—To de-size albumenised paper, remove the albumen first of all. This is effected by immersing the paper in *cold* water and agitating gently. If hot water were employed the albumen, instead of being dissolved out, would be coagulated and rendered insoluble. When the albumen has been removed by this treatment transfer the paper to a vessel containing hydrochloric acid, in which allow it to be submerged for a few seconds; after that it is to be transferred to a vessel containing water, so as to effect the removal of the acid. The paper will now be found to be denuded both of the albumen and the size.

W. D. C.—This correspondent asks—"Which is the best dry process?" This question is one that would be replied to in a different manner by each successful worker with any definite process. We know one gentleman, for example, who believes that the Fothergill process possesses certain advantages over all others; but this opinion is controverted by another, who finds in the tannin process everything that he conceives to be desirable. A third, fourth, and fifth would probably express their preference for gelatine emulsion, collodion emulsion, gum-gallic, or one or other of the numerous excellent methods of preparing dry plates which are now practised with great success and certainty by one or more photographers. Of course *we* decline the responsibility of giving a reply to the question.

A VICTIM writes:—"On the 26th January there was an advertisement in your Journal requesting operators to send their terms and specimens to a given address; I did so, and never having heard I suspected something was wrong, and on making inquiries found there was no such man or even such a place as mentioned in the advertisement. I only write this as a caution to operators, &c., to be careful when they send their valuable specimens."

BROOMIELAW.—This correspondent, in the course of his reading, has found a statement in one of the journals devoted to photography to the effect that the true, or equivalent, focus of a portrait combination can be ascertained by focussing exactly an object having the camera so adjusted that the size of the image on the ground glass shall be identical with that of the original object, then measuring the distance between the ground glass and the image and dividing it by four. He inquires concerning the accuracy of this method.——In reply: the method described answers well enough if only a rough approximation to the equivalent focus be desired, but it does not give the true focus, as could easily be demonstrated by means of a diagram, the introduction of which in this column would be inexpedient.

☞ **Editorial Communications should be addressed to "THE EDITORS"—Advertisements and Business Letters to "THE PUBLISHER"—at the Offices, 2, York Street, Covent Garden, London, W.C.**

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PHOTOGRAPHY IN COURT.—At the Lynn County Court, on Wednesday, the 21st inst., William Hoare, trading as Reeve and Hoare, stationers, of London, sued Edwin Bullock, of Lynn, photographer, for £4 3s. for goods supplied. Mr. Wilkin appeared for the plaintiff, and Mr. Beloe for the defendant. The circumstances of the case were peculiar, and are these:—The plaintiffs had in their employ a traveller named Ramm, who called on the defendant soliciting orders. The defendant, believing that complainant solicited orders for himself only, gave him an order for goods amounting to something like £5 on the condition that the traveller bought something of him. The traveller bought a hundred views of Sandringham, &c., and the defendant paid him the difference in the account. The plaintiffs, however, subsequently sent an invoice of the ordered goods, and requested payment of the sum of money which had been paid in goods to the traveller. The defendant refused to recognise plaintiffs; but his honour, while severely censuring the conduct of Ramm, ordered a verdict for the plaintiff for the full amount, intimating that if the defendant did not own the plaintiffs in the matter he ought to have sent the goods back at once; he also pointed out to the defendant that he had his remedy against Ramm.

COLOURING PHOTOGRAPHS.—The process of colouring photographs is by no means so difficult a matter as you might at first have supposed. There are certainly some obstacles to be encountered, but you will soon overcome them, provided you will sit down with a determination to overcome them. You must be patient and persevering, go gradually on, endeavouring to improve with every stroke you take, keeping the tints of the face and background light, gaining colour and depth by repeatedly working over them; the effect thereby produced will be infinitely superior and far more artistical than if you had at once laid on the colour as strong as required. Avoid, as much as you possibly can, all washing out of tints after they have been once put on, for the surface of the photographic paper is of a delicate nature, and will not bear much rubbing. Again: you must not feel disappointed if your first efforts do not turn out altogether as satisfactory and pleasing to you as you had hoped for. Do not give up in despair, but go on, persevere, and good coloured pictures will be your reward in time. Be particular in procuring good photographs to work upon and experiment with; also, good colours and pencils to work with, for your success will in a great measure depend upon these. Do not be over anxious to get a very high finish to your work at first, which, after all, does not constitute excellence or perfection, for a good picture may be satisfactory without it, while a very bad one may have it in excess. The highest finish is labour in vain, unless at the same time there be preserved good lights and shadows, which actually make up a good, finished picture.—*Practical Photographer.*

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METEOROLOGICAL REPORT,

Observations taken at 406, Strand, by J. H. STEWARD, Optician.
For the Week ending February 28, 1877.
THESE OBSERVATIONS ARE TAKEN AT 8 A.M.

Feb.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks.
22	30·08	N	35	37	42	35	Cloudy
23	29·94	NNE	35	37	45	35	Cloudy
24	29·73	WNW	42	44	52	36	Cloudy
26	29·18	NW	41	45	45	40	Cloudy
27	29·81	W	34	36	41	32	Bright
28	30·18	NW	—	30	—	26	Bright

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 879. Vol. XXIV.—MARCH 9, 1877.

ON FILTRATION, AND A SIMPLE ARRANGEMENT FOR FILTERING VISCID LIQUIDS.

Undoubtedly one of the greatest of the minor troubles connected with the practice of photography is the necessity of frequent filtration of the various solutions, for the operation, though excessively simple in theory, presents certain difficulties in actual practice which we fear too often lead to its neglect, and, consequently, to the production of slovenly or defective work. The difficulties experienced are entirely of a mechanical nature, and vary according to the character of the solutions to be operated upon; as a rule, aqueous solutions are more easily filtered than alcoholic, on account of the extra care required to prevent evaporation of the volatile liquid in the latter case. Simple solutions of salts also are more easy of management than those of a viscid nature—such as gelatine, albumen, or collodion—while the presence of a solid precipitate adds to the difficulty of the operation by clogging the pores of the filter and preventing the free passage of the solution.

In the case of an aqueous solution it is the almost invariable custom, at least amongst photographers, to employ for filtering purposes a specially-prepared bibulous paper; and, as this is easily obtained of suitable quality and answers the end in view, there is little reason to alter the system. But, unfortunately, the mere fact of the employment of a suitable description of paper does not ensure successful and rapid filtration; that result is dependent upon the method of forming the filter and its relation to the shape of the funnel in which it is supported, and the latter is not always such as to produce the most satisfactory result.

The usual, and perhaps the best, way of folding the filter is to double it twice in directions at right angles to one another, so as to form a hollow cone; but the shape of the interior of the funnel is too often found to coincide so exactly with the line of a filter so formed as to come in contact with its whole surface, with the exception of the extreme apex, and thus the passage of the liquid is rendered inconveniently slow. This may be obviated by a slight departure from the ordinary way of folding the paper. Instead of doubling it exactly at right angles let the second fold deviate more or less from the square, according to the shape of the funnel to be used. The effect will be to give the filter a more obtuse form, and thus leave a space between it and the funnel, on which it rests only upon its upper edges. With very thin paper it will be found necessary to resort to a further expedient in order to prevent the filter breaking by the weight of the liquid it contains, if unsupported except at its upper portion. In such cases the paper must be folded to fit the funnel; but three or four straws or thin strips of glass must be interposed between the paper and funnel so as to form, as it were, channels down which the liquid may run into the neck of the funnel. We may here remark that it is not the thinnest descriptions of paper which allow the liquid to pass most rapidly. We have in our possession at the present time a sample of very fine Swedish filter-paper but little thicker than *papier Joseph*, which offers most extraordinary resistance to the passage of liquids of any description. In addition to this it must be borne in mind that the thinner the filter the closer will it cling to the supporting funnel, and, *ergo*, the smaller will be the surface in active operation. Many methods of folding the paper have been proposed having for their object the formation of a larger filtering surface; but they are, one and all, objectionable, either on the ground of their complication or incapability of supporting the weight of the liquid to be filtered.

In addition to paper other substances have been and are frequently employed for filtering purposes, such, for instance, as sponge, cotton wool, tow, asbestos, fragments of glass, and numerous others. Cotton wool is wholly unsuited for use with aqueous solutions on account of the repellent action it exhibits towards water, but it answers better for liquids of a spirituous character. Sponge is too liable to "choke," and requires great care in adjusting it in the neck of the funnel in order to get it to filter at all. The best of this class, and one which deserves to be much more generally used than it is, is tow, which is easily permeated by both water and spirit, does not choke, and, above all, is extremely cheap. The two last named are frequently found useful by the chemist in filtering solutions of a corrosive nature, which would act upon and destroy the ordinary filters; they will not, however, be of much use to photographers.

So far our remarks have been confined to plain saline solutions; but when we come to the class comprising such substances as gelatine, albumen, gum, &c., we find the difficulties intensified by the natural viscidity of the liquid, and in the case of collodion or spirit varnish by the volatility of the solvents. Other expedients have been adopted as substitutes for the slow process of filtration in such instances, but only with partial success, as both decantation and clarifying are subject to the same charge of slowness. Collodion, however, forms an exception, as it may be successfully cleared by decantation in a very short time, indeed this method is by many preferred to filtration; but with emulsions the case is entirely different. In filtering an emulsion the sole object—provided of course the collodion has been properly filtered previous to sensitising—is to remove any accidental particles of foreign matter, such as filaments of cotton, specks of dust, &c., which may have been introduced into the emulsion during sensitising, as well as any coarser particles of bromide which may be formed. This object is fully attained by passing the mixture through a tuft of cotton or a piece of sponge loosely packed in the funnel, and which permits the passage of the finer particles of bromide; if, however, the emulsions were allowed to rest and the upper portion decanted it would be found that a very considerable portion of the sensitive material had subsided and the film rendered too thin.

In filtering large quantities of emulsion it generally happens that, though the first portions pass rapidly through the filter, the latter rapidly becomes clogged with the fine particles of bromide, and the operation gradually ceases, necessitating a frequent change of the sponge or cotton. To overcome this difficulty the application of the principle of the force pump has been utilised in order to bring about the rapid filtration of such viscid liquids under pressure. The following will be found a simple arrangement, equally applicable to volatile or non-volatile liquids, to collodion or emulsion:—

Provide a strong, wide-mouthed bottle, with lipped neck and a tightly-fitting cork or bung. In the latter bore two holes, into one of which fit a "thistle-headed" funnel sufficiently long in the tube to allow the head to reach nearly to the bottom of the bottle, while several inches of the tube project outside; the second hole will contain a tube bent at a right angle, and reaching just through the cork. Both tubes must be fitted perfectly air-tight, which may be done by cementing them into the cork with a thick solution of gelatine containing a little chrome alum; three or four coats of a thinner solution may be applied to both sides of the cork in order to stop any small holes which may exist, each coat being allowed to dry thoroughly before applying the next. The cork will now be air-tight, and neither water, alcohol, nor ether will have any action upon it. The projecting tube of the thistle funnel must now be bent into the form of a syphon and the filter is complete.

When required for use a small piece of flannel, or two or three thicknesses of muslin, are tied securely over the funnel, the liquid to be filtered placed in the bottle, the funnel plunged into it, and the cork fastened down by passing a piece of twine or wire under the lipped neck; upon forcing a stream of air through the second bent tube the pressure upon the surface of the liquid will cause it to pass through the filter tube into another bottle or vessel placed to receive it. The pressure may be applied by attaching the nozzle of a pair of bellows by means of india-rubber tubing to the bent glass tube of the filter; but the bellows must be provided with a valve to prevent the ingress of air by way of the nozzle. It will be unnecessary to work the bellows continuously, as a few strokes will compress the air in the bottle sufficiently to keep up the action of the filter for some little time when once started. Other means will suggest themselves by which the same result may be attained, but we give the bellows arrangement as most simple.

To those who are in the habit of using large quantities of emulsion, solutions of gelatine or albumen, the foregoing will recommend itself as a ready and convenient means of securing rapid filtration. As we have described the arrangement above it is more adapted to the use of amateurs or those in a comparatively small way; but upon a large scale the principle becomes still more easy of application.

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BRICE'S PATENT ACTINOMETER.

The value of actinometers to the photographer is scarcely yet thoroughly appreciated. In all operations in which the result is not immediately visible, such as the exposure of a plate in the camera or the printing of a positive on carbon tissue, one of two courses is absolutely necessary—either to fall back upon previously-acquired experience so as to give the correct exposure, or to make use of the actinometer, by means of the visible change in which instrument the proper time to be allowed for producing the invisible changes on other surfaces or in other bodies may be gauged with a near approach to accuracy. Carbon printing is, so far as we have seen it in operation, always conducted by the aid of an actinometer; but, for the determination of the proper time to expose a sensitive plate in the camera, none of the actinometers at present in use, or, at anyrate, none of those now obtainable, or which have yet been brought under our notice, have been practically available.

In an actinometer recently introduced by Mr. William A. Brice—whose name is known to our readers as that of the inventor of a portable photographic apparatus for obtaining negatives by the wet collodion process without the use of a dark room or tent—this desideratum has been sought to be supplied. Before making any observations of a critical nature upon this the latest addition to our actinometric resources, we shall first of all give such a description of the instrument as will enable every reader to understand it perfectly.

In a square mahogany frame, about 4½ × 4 inches, are arranged, side by side, five slips of glass possessing different grades of actinic transparency. The central slip is composed of plain, colourless glass, the slips on each side of the centre being composed—one of *one* thickness of glass of a pale yellow colour, the other of two thicknesses of the same kind of glass. The remaining two slips which occupy the position of the marginal bars of this actinometric gridiron are formed respectively of three and four thicknesses of the yellow glass. It will thus be seen that the actinic opacity of these bars proceeds in arithmetical progression, as each in succession is composed of the same number as the former, with an increment of one.

The method of using this actinometer—to which its inventor gives the name, as an *alias*, of a "Photographic Testing Plate"—consists in having it interposed, either by standing or suspension, inside of the camera immediately in front of the sensitive plate, to which it should be placed in as close proximity as possible without touching. The actinometer having been thus placed the image of a sitter is focussed, and a very full exposure given. Upon developing the image it will be found that certain parts, corresponding to those bars that offer least resistance to the passage of the actinic light, will be more acted upon than others, the negative showing, in fact, strips of over-exposure, under-exposure, and proper exposure.

If in the portion shielded by the slips of quadruple power there be any trace of fog, then it will be known that such fog does not arise from any action of the light, but from an abnormal condition of the nitrate of silver bath. If there be no fog, then it will be known that the bath is in good condition.

It is claimed by the patentee (for the instrument is the subject of a patent) that by the information obtained from a trial conducted in the manner we have described an operator is able "to decide with great certainty where a fault lies, and to fix the exact amount of exposure required" for a picture to be taken under the same conditions. Having removed the frame, and re-focussing the picture, he then proceeds to take the second or final negative, thus "avoiding great waste of time, chemicals, clean plates, temper, &c., and also affording comparisons of scientific value, because accurate, between the merits of various lenses, chemicals, processes, and sources of light."

In making a trial of an actinometer placed at our disposal by Mr. Brice, we used a rapid-acting lens, and gave an exposure, to a landscape subject, of a minute and a-half, with the following results:—The central portion representing the clear glass bar was very much overdone; the portion masked by a single thickness of the yellow glass was fairly exposed for a positive, but not sufficiently so for being developed into a negative having proper printing intensity; while the bar next in non-actinic progression only showed a feeble outline of the sky, no other portions of the image being at all visible.

The question now arises—What data have been obtained by the experiment described upon which to base exactitude with another exposure which, if made immediately afterwards, would be correct for that subject? Being unable to reply to this question, we have stated the case to Mr. Brice, who informs us that we must give a much more prolonged exposure to the first or trial picture—such an exposure as, for example, would yield a fully-developed image under the third bar. The time of exposure given having been noted, the correct time for obtaining a properly-exposed negative is the third of that given. This applies to any other of the bars under which a correct exposure was obtained, whether it be the third, fourth, or fifth, the final exposure for the picture to be reduced in a corresponding degree.

We are not sufficiently well acquainted with the routine of a portrait gallery to know if an operator considers it necessary to take one or more trial negatives at the commencement of a day's work in order to ascertain the correct time for exposing; but to those who may be in the habit of doing so an actinometer like that which we have now described cannot fail to be serviceable.

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PHOTOGRAPHS FOR "CHARMS."

Photography is a giant child of such quick growth that the facts of its infancy, though all within the experience of a lifetime, are already historical. It seems but yesterday that everybody was delighted and astonished at one of its productions—the microphotograph—where, in a space no bigger than the smallest pin's head, we saw condensed and clearly legible, by the aid of a powerful magnfier, an amount of printed matter that then appeared most marvellous. A sheet of newspaper, or, more commonly, the Lord's Prayer or the Creed, was very shortly afterwards to be seen as a microscopic slide in the cabinet of nearly every microscopist in the kingdom. These photographs, however, being mere interesting curiosities, neither useful nor ornamental, their popularity soon waned, and practically they died out. We believe only one person in England even made their production a commercial matter. But the process contained the germs of usefulness; it may almost be said to have made the siege of Paris a possibility. Everyone will call to mind the services of the pigeons and their countless messages written by photography alone; and for many years past we have been familiar with that popularised form of the miniature photograph which, in combination with a small lens inserted into an ornamental mounting, is known as the "photographic charm."

We have been asked more than once how these minute things were made; and, although most of the information may be found scattered throughout our various volumes, we have not concisely presented the whole process as we now proceed to do. It has been thought that, judiciously cultivated, it might be made a lucrative addition to the business of a professional photographer; and indeed we know of one gentleman who opened an establishment solely for the purpose of supplying the public with photographs mounted as "charms" from their own subjects. It is to some extent remarkable, however, that with almost this one exception their manufacture is confined to very few hands, who must annually send out some hundreds of thousands of these photographic "charms."

The only apparatus required which would not be found in every studio is a medium-power microscope objective, which should be mounted in a small camera with repeating back, whose dark slide is most accurately made so as to ensure perfect register between it and the ground glass. This is a most difficult end to attain, and the camera-maker's work for this purpose must be very closely criticised before it is admitted among the studio properties. The best plan is to have the dark slide fitted with a loose ground glass, and when the object is focussed to replace the glass with the sensitive plate. In copying the original pictures the negatives should always be produced of such uniformity in size as to require little or no re-adjusting of the focussing arrangement. This will be found a great saving of time. The negatives should be, when properly taken, rather thinner than ordinary, though, of course, any negative in the photographer's possession is at once available without any alteration. It must be remembered that in all lenses but those made purposely for photography the actinic and the visual foci do not coincide, and, therefore, a little allowance must be made to counterbalance this difference. A few trials will easily give the working distance. In the more important establishments cameras supplied with a large number of objectives, worked with a repeating back, are used to facilitate the production of considerable quantities, and then the greatest care in the adjusting of the focus in the first instance, and in the perfect working of the carrier is required, the amount of irregularities, from imperfect definition, &c., at first being frequently thoroughly disheartening. The mode of photographing the transparency from the negative is just the same as is employed for ordinary wet collodion enlarging or transparency work. It will be found most convenient to have the camera horizontal, sending the light through the negative by a mirror, if an uninterrupted horizon is not available. The operation of focussing (when necessary) having to be performed by a microscope, it would be inconvenient to have the arrangement tilted upwards.

So much for optical considerations. It is unnecessary to observe that a collodion as free from structure as possible is desirable; but this, which in the earlier days of photography was rather difficult to obtain, need give no trouble. Almost any collodion in the market, if carefully used, will meet all requirements if care be taken to have it clear and clean, and to keep it of a proper thickness by the judicious addition of ether and alcohol, as it thickens from use. Great care must be taken to keep it free from dust; and on no account should the bath be allowed to reach the "pinhole" stage. The bath must likewise be kept very clear, and, in fact, here also it will be an advantage to make use of the two-baths system, making the first of full strength and the second from fifteen to twenty grains to the ounce, the second bath being kept perfectly clear.

The development may be conducted in the usual manner by iron of a strength of about ten grains to the ounce. It will be very advisable always to work with the developer of a uniform strength and temperature, as it is quite impossible to observe during the act of developing whether the faces show sufficient half-tone, &c. After a few trials it will be enough to observe the rapidity with which the image makes its appearance; a little close observation on this point will very soon give the operator sufficient skill to see at a glance whether the exposure has been correct. If the exposure and development have been properly timed and carried out no toning solution will be needed, the plain iron-developed transparency being sufficient for all purposes, and a large range of colour being available by varying the exposure.

The various pictures being now taken there remains the varnishing; still, in view of further processes, this operation, though advisable, is not absolutely necessary.

The next step is to cut the transparency into pieces, each one with the photograph as accurately as possible in the centre of proper size, for attaching to its lens; a sort of framework is used for this purpose in large establishments, but on the small scale an ordinary glazier's diamond is all that is required. We may now consider how the fastening of the photograph to the lens is performed.

If a piece of glass constituting the optical part of one of these "charms" be removed it will present the appearance of a long glass cylinder—flat at one end and round at the other, the outer flat end being really the surface of the piece of glass just described, upon which the photograph rests, and the round end converting the cylinder into a microscope—a Stanhope lens, in fact.

These lenses are to be obtained ready made in Paris; but, when purchased, instead of being of a circular section, they are square, with plane and curved ends as just described. The tiny square piece of glass which holds the image is cemented to the plane surface of the lens by the aid of Canada balsam, which should be of pretty stiff consistency and applied warm, the lens and picture also being warmed. It sets directly after cooling, and the whole is then put on one side for a few days to harden. Of course the lens and picture is now quite complete; but the little apparatus is more generally available if an evenly-formed cylindrical shape be imparted to its sides, in the manner which, it will be observed, all the Paris "charms" are treated.

To give this rounded form to the sides a specially-constructed grinding or polishing apparatus is made use of, which in a very short space of time takes off the corners, and gives that complete and finished form to the whole which enables it to fit so accurately into the apertures designed to receive it. It occurs to us, before closing this article, to mention that there is frequently a difficulty in obtaining ground glass of a sufficiently smooth, even surface for microscopic definition; this can be overcome by making one's own focussing screen. A solution of gutta-percha in chloroform poured over a plate, and dried, will be found to give a beautifully-even surface—superior to most surfaces, however obtained. This wrinkle, we need not obseve, is applicable to many other purposes besides that here indicated.

DIALYSIS as applied to gelatine emulsion has been wellnigh driven out of the field by the simpler method now in vogue of washing the pellicle while in the state of jelly; but in our last number, page 102, "F. S. K." gives another reason why the latter is the preferable course. We have never ourselves noticed any peculiarity in the behaviour of a dialysed emulsion which would distinguish it from one which had been washed in the ordinary manner; but, according to our correspondent, such a difference does exist, and is traced to the presence of a substance soluble in cold water and which is removed by prolonged soaking, but refuses to pass through the septum of the dialyser. It appears somewhat strange that, after undergoing all the processes necessary to obtain gelatine of the requisite purity, it should still retain traces of what must be considered an impurity; but we have entirely failed in discovering any such substance. Still, if it do exist, it may in all probability, as

"F. S. K." suggests, conduce to irregularity or instability of the emulsion. We have noticed on several occasions a peculiar formation in emulsions of gelatine which at first we attributed to incipient decomposition, though the attendant circumstances have been entirely unfavourable to such a view. Later we were led to change our opinion, and to set the result down to some combination between the gelatine and the inorganic constituents of the emulsion. The phenomenon in question consists of a delicate flocculent matter, which makes its appearance in the washing water, having the appearance of finely-divided gelatinous matter, insoluble both in hot and cold water, but how formed it is impossible to say. We have met with it generally when using free ammonia in the emulsion, our first experience of it being in connection with Mr. Johnston's double salt of silver and ammonia, and we can reproduce it at will by employing ammonio-nitrate of silver for sensitising. Is it not possible that the soluble matter spoken of by "F. S. K." may be formed in a somewhat similar manner?

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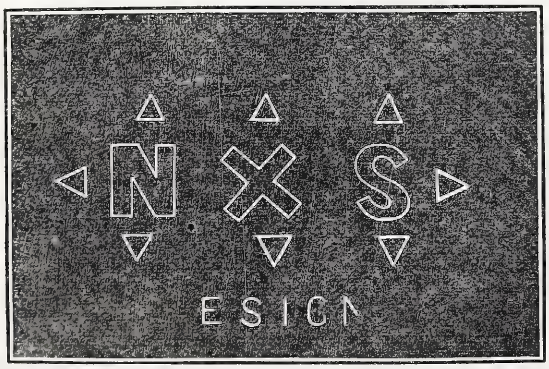
MAGNETO-PHOTOGRAPHY.

[A communication to the South London Photographic Society.]

For many months past I have been experimenting in this peculiar phase of photography to see if I could corroborate the statements made by Reichenback in regard to the influence of the magnet on the sensitive plate. I am fully aware that it has been tried by several, and they have given it up. I have spent a great deal of time on these experiments. At first I obtained nothing but failures, and sometimes only a very faint indication on the plate, although with only gaining this faint phantom image it gave me encouragement; and now under certain conditions I can get an image on the sensitive plate in total darkness in a shut-up box, showing that a sensitive plate *is affected* when brought within the influence of the poles of a magnet. I have not yet concluded my experiments, and hope at some future time to give a full detailed account (jointly with my friend Mr. Henry Collen, of Brighton).

Our President has this evening asked me to give the results of one or two experiments which are very peculiar, and at his wish I do so; but at present I cannot invite discussion on the subject, as I did not intend mentioning it to the members for the present, so I am quite unprepared, not having the plates with me, which would show for themselves how far I have succeeded. I have made my experiments with an ordinary horse-shoe magnet about eight inches long, which I placed in a box, poles uppermost, and above the poles a perforated card (about three-eighths of an inch above the poles of the magnet). The card is the size of a quarter-plate $4\frac{1}{4} \times 3\frac{1}{4}$, thus—



The letters N S, the cross, and the little triangles are the perforated parts of the card. The part with the letter N is placed over the north pole of the magnet, and S over the south pole. When the card is in the position as before stated the sensitive plate is placed one-eighth of an inch above the card, making half an inch between the poles of the magnet and the sensitive plate.

I must not omit to mention that I blackened both the surfaces of the card with indian ink. Not having a brush at hand, I took the solid lump of ink, wetted it, and rubbed it over the card, which ground up the surface to a certain extent. Having placed the sensitive plate in its position I exposed in the closed box in total darkness to the influence of the magnet from three to fifteen minutes. The plate was then taken out and developed. Where the perforated parts of the card are, sometimes I have developed a negative image and sometimes a positive image, as if ordinary daylight had had access to the plate; but the strangest part of all remains to be told, and it is this:—

On exposing one plate, when I developed it just below the letters N S and other openings there was also developed the single line letters, as shown in the diagram of the card, E S I G ᚾ. The last is a part of the letter N. I thought this was very extraordinary. No letters were visible on the card. It was an ordinary printed business card that had been used, having all the printed matter blackened over, and not only blackened over but ground up by the way I applied the indian ink; but there the letters were to be seen perfectly sharp on the plate. I looked at the plate and examined the card for a long time, and at last, by looking at an angle across the surface of the card, I could faintly (very faintly, indeed) just see slightly the letters described, but could only see them on the card with great difficulty; on the developed plate they were perfectly defined.

As the card had been in use for the same purpose some time I could not remember what card I had used, but after trying what part of a word the letters would form I found it to be a part of the word "designer." I then remembered I had used a business card of a friend of mine. I had several of the same sort by me, and on hunting up a similar card there was the word in the same character of letter.

It would have been quite impossible to have photographed these letters on the blackened card with a camera and lens in ordinary daylight, and the fact is this:—I have not only obtained impressions of the perforated parts without daylight, but I have an impression of an almost invisible image by some means of reflection (for the letters were on the upper surface of the card) and produced without daylight, with contact, and without either camera or lens. At present I do not offer an opinion, but only make a statement of the facts as they occurred. William Brooks.

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THE COLLODIO-BROMIDE EMULSION: SOME OF ITS APPLICATIONS.

[A communication to the South London Photographic Society.]

The first application I will treat of is the adaptability of the emulsion for the preparation of moist plates to be developed in the field. Having recently read a paper on this subject before the Photographic Society of Great Britain I will now add a few supplementary remarks. With further experience of this method of working I see no reason to alter what I said on the occasion referred to, except in a few minor details. For instance: in applying the solution of carbonate of ammonia I think it better to use a small tray or dish, made of any suitable material. I have one of zinc a trifle larger than the plates I work. Into this I put the exposed moist plate, flush it with the ammonia solution, return to the bottle, and then take on a pneumatic holder and continue development with a solution of pyro. in water, restrained, if necessary, with a few drops of a solution of bromide of potassium. When I judge the details are sufficiently out I stop development with a wash of acidulated water. After this, if I choose, I can continue with acid pyro. and silver, and when sufficiently dense again flush with the acid water, when the negative may be stored away to be fixed at any convenient time. I have with me a negative still unfixed developed as above.

I will not trouble you with anything further on this subject, but go on to the next application in my paper. This is the great power it places in our hands for enlarging from small negatives without the usual intermediary transparency. To do this it requires to push development with alkaline pyro. until the image is seen to be developed well through. This may be judged of by looking at the back of the transparency, for such it is up to this stage. If it appear sufficiently developed the next step is, instead of fixing with hypo., to dissolve away the image with nitric acid. I use acid and water in equal proportions. The image is dissolved almost immediately, and it has then the appearance of a very delicate negative which will require strengthening. This may be done by exposing it to light (either day or artificial), and the time of exposure is of no moment. Then, having kept the alkaline developer, flow it over, and allow it to remain on a minute or two, when the result will be a vigorous negative.

I hand round an enlarged negative and a transparency, both taken from the same small negative, the only difference in treatment being that one was fixed with hypo. and the other with dilute nitric acid. I have examined both very closely, and cannot detect the slightest deterioration in sharpness from the original negative, which I also hand round. The negative has been enlarged about two, and the transparency three, diameters.

From the foregoing it will appear that, when using the bromide emulsion, it is a matter of indifference whether an enlargement be made from a negative or a positive, it being simply a matter for individual convenience. To further illustrate this capability I hand round two 8 × 5 plates exposed and developed today—one being a negative and the other a positive image.

There is another probable application of the emulsion of which at present I can do scarcely more than speak suggestively, and that is the probability of its being used for the production of enlarged paper proofs, which would be valuable in cases where only one or two prints were required. The general defect in developed prints is a heaviness of the shadows, but I believe this defect may be overcome by using a suitable developer; at all events, the only trial I have made seemed to me very promising. There was perfect gradation of tone without the heaviness above mentioned, but, unfortunately, I was called away while the exposure was going on, consequently it was overdone and gave a flat print. I shall experiment further in this direction, and communicate the results to your Society.

The next application I need scarcely refer to, and that is its suitability for the preparation of dry plates. For the production of transparencies for the lantern and stereoscope Mr. W. Brooks, at the last meeting, read an almost exhaustive paper, and, in fact, appears to have made the subject so completely his own that it is unnecessary for me to say more.

Finally: I may allude to the fact that without the washed collodio-bromide emulsion our esteemed and energetic fellow-member, Mr. L. Warnerke, would have been unable to manufacture the sensitive tissue with which his name is associated, and which for many purposes is of undoubted and great value.

P. MAWDSLEY.

SCIENTIFIC JOTTINGS.

IN a very interesting paper, by Mr. Archibald Liversidge, *On an Abnormal Form of Gold and Silver*, read before the Royal Society of New South Wales, but possessing no general attraction for photographers, incidental allusion is made to a quality of sulphide of silver not generally known. This salt, being a very important product from photographic waste, it will be desirable to call attention to Mr. Liversidge's extract, which he takes from *De la Beeche's Geological Observer*, page 768, to the following effect:—"Artificial sulphuret of silver was found to be readily decomposed by steam, and more easily so at a moderate heat. At a temperature under the melting point of zinc this was soon effected, and the silver effloresced in such forms as to induce M. Gustav Bischoff to regard the moss-like and filamentous occurrence of native silver in veins as very probably the result of the decomposition of sulphurets."

Geological facts of considerable importance to gold mining have also been discovered in Australia. Hitherto gold has been mostly found in alluvial deposits, or more recent geological formations; but Mr. C. S. Wilkinson, of the Geological Survey of New South Wales, has observed what seems to be a new discovery—that gold, in sufficient quantity to be worth mining, occurs in a conglomerate belonging to the coal measures, and that the alluvial gold from the old Fallaway Diggings has been derived from the waste of these conglomerates. He points out that, apart from the scientific interest belonging to such an old auriferous alluvial, considerable importance attaches to this discovery, seeing that the conglomerates may now become a new source of the precious metal. At Clough's Gully the actual conglomerate is now being worked, and yields from one to fifteen dwts. of gold per ton, and nuggets sometimes weighing five ounces. What vast stores of wealth this discovery will open up! It almost leads to the supposition that the value of gold, *i.e.*, its purchasing power, will decrease still more rapidly than it has done, but we see no chance of its cheapening photographic manipulations.

The obscure but photographically-instructive subject of phosphorescence was very ably treated early in the year, by Mr. W. Thompson, F.R.S.E., in a paper read before the Manchester Literary and Philosophical Society. He called especial attention to some very excellent phosphorescent bodies, mostly sulphides of the alkaline earths, their luminosity being greater than any hitherto prepared. They were produced by M. André, the laboratory assistant of M. Ed. Becquerel, who has devoted much time to the manipulation necessary to produce the greatest degree of luminosity after holding them in the sunlight for a few seconds. M. Becquerel has devoted much time to the investigation of luminous phenomena, as our readers are aware, and he finds these sulphides, which are chiefly amenable to the most refrangible rays, of great service in investigating the ultra-violet rays. Mr. Thompson gives a list of sulphides. The colours they assume in the dark after previous exposure to light are green, orange, blue, violet, yellowish green, and yellow, from sulphide of calcium, heated with one or two per cent. of manganese, binoxide, sulphide of calcium, sulphide of strontium, calcined with four or five per cent. of sulphide of antimony.

Experiments in the manufacture of carbon conductors for electric lights have been made by M. Carré. Moistening carbon in powder with syrups of gum, gelatine, &c., he gets plastic and consistent pastes very suitable for making carbon prints of. Even without other mixtures, he stated before the French Academy of Sciences that they give more light than the ordinary carbons, in the proportion of 1·25 to 1.

We have not recently referred to the radiometer, as, practically, it may be considered proved of no use to photography; but it is still a problem of great interest, and some men of the highest calibre have still its phenomena under investigation. Dr. Buff has recently placed one of these instruments side by side with a thermo-multiplier in the cone of light (admitted through an aperture in a board) of a gas lamp, which could easily be regulated and kept constant for some minutes. There was a glass disc in front of the thermo-pile. In the galvanometer the deflections of the needle were proportional to the deflecting force up to 21°. On tabulating the deflections and number of rotations it was seen that their production almost always was a constant number, from which the inference was drawn that the velocity of rotation of the little wheel is inversely proportional to the heat action of the penetrating rays, thus confirming the opinion that the moving of the radiometer is due to an action of heat rays which penetrate the glass. The subject is also to be taken up by M. Becquerel in his course of lectures, at the Paris Museum, on *Light and its Effects*. The course of lectures will begin after Easter, and not a little curiosity is felt to hear what M. Becquerel will have to say on the matter, he having hitherto, and also his son, abstained from public statements on this topic.

Some investigations and analyses have recently been made on the crystalline lens of the eye, M. Laptschinsky stating that all existing data are not sufficiently complete. He found them to contain 34·93 per cent. of albumen with other animal products. It was accompanied by very little fat, and we are thus led to think that there are the germs of a useful process here. Why not collect the eyes of the daily slaughtered animals, extract from them the clear, transparent matter of which they are mainly composed, *i.e.*, the vitreous, the aqueous, and the crystalline humours, and then use them for albumensing paper?

PHOTOGRAPHY AS AN AID TO THE ARTS AND SCIENCES.

[A communication to the Glasgow Photographic Association.]

PHOTOGRAPHY, as the youngest of the sister arts, may be described as the handmaid of her elder sisters, and as gently aiding them in accurate and graceful development. In painting and the decorative arts she stands at the threshhold and lights their way in supplying from inexhaustible nature copies of all that is fair and beautiful, leaving to the artist to fill up in colouring the outlines she has truthfully given.

It is true that painting, sculpture, and the decorative arts have made great progress long before photography joined the gentle band, and that the great masters of antiquity, and even of modern times, had given to the world imperishable works before she became a co-worker. But then it is in art as it is in literature—genius in either direction does not flow with the regularity of seed time and harvest, but delights in taking the world by surprise when least expected. The advent of a Raphael, a Michael Angelo, or a Faraday gives an impetus to chemical research and opens up new sources of wealth and usefulness by enlarging our knowledge of the properties of matter; but photography may be regarded as the latest and most important contribution made to the fine arts, and all the more valuable as it owes its origin to scientific observance of the natural laws. Hence, in an age like our own, when the arts and sciences are becoming every day more and more an essential of a liberal education, we may claim for photography a more important recognition in upward progress. Nor in the entire range of the sciences is photography less backward in lending a helping hand. From the innumerable objects of beautiful interest that arrest the eye of the botanist—whether the fragile blade of glass, or the richly-coloured, full-blown flora of the garden—to the more sublime planetary orbs that roll in the immensity of space, photography is alike the helpmate and guide of the student of nature.

Or in the more rigid mechanical sciences is photography less indispensable as an invaluable aid to improvement and accurate deduction. What would our elaborate mechanical treatises be without illustration? True, the skilful draughtsman has hitherto supplied all that is wanted in this way, but it will not be denied that here, as in other objects, photography renders essential service, as accuracy in outline and detail is of the first importance in complicated mechanism. Here the most practised eye must yield the palm to the art of the photographer. Indeed it would be difficult to mention any branch of investigation or knowledge that adds to the refinement and progress of mankind in which photography may not be a vital—nay, almost an indispensable—agent. The monuments and works of the past are doomed, as well as their authors and projectors, to crumble away and yield to the iron tooth of time; and, for aught we know, a world of art-treasures may have been consigned to oblivion in the earlier ages, and not one vestige left to hint at their existence. But how different the result would have been, and how much richer the world in all that is calculated to sweeten the amenities of life, purify taste, and elevate humanity, had some antique photographer arisen and transmitted to posterity copies of the lost treasures! The histories of Egypt, Greece, and Rome would have been far from complete, so far as art is concerned, had not the photographer given us faithful representations of their matchless skill in sculpture, architecture, and many of the decorative arts, and the best descriptions of their vast and gorgeous temples, amphitheatres, and public buildings would have conveyed no adequate idea but for the invaluable aid of photography.

Nor is the absence of this art less to be deplored when we consider the ancient illustrious dead—philosophers, poets, orators, sculptors, &c. We have transmitted to us no reliable portraits of how they looked. Who can tell what kind of features blind Homer, Æschylus, or Demosthenes had, or what the expression of their faces? Or of the line of Roman emperors—whether they had vulture noses or not? Indeed, we are only left to guess the appearance of the men who conquered and governed the nations of antiquity. Here I would just remark that in this respect photography has done for modern times a service that cannot be over-estimated; for in all time coming the generations that are to follow will be made as familiar with the appearance of every class of eminent men as those were among whom they lived and had their being.

In our country we are justly proud of our literature and of our poets (who have immortalised our streams and picturesque scenery), novelists, and antiquaries who have revived the past, and invested with life the crumbling towers and castles, the mouldering cathedrals, and abbeys, the dungeon fastness and fortress that in their ruins tell of wars, feudal strifes, and crimes. These old landmarks, connecting the past with the present, have an undying interest about them, and photography thus makes literature its debtor in presenting before us all that remains of their perishing grandeur. Or, again, it pictures for us our romantic streams and rugged mountains, and thus enhances the descriptions of the poet.

To show how rapidly photography is coming to the front in our time it is now customary in exploring expeditions that a photographer should accompany each, as in the case of the *Challenger* in its scientific cruise and in the late expedition to the polar regions, in both of which the art was of invaluable service in enriching natural history and botanical research. And in late years, as you are all aware, the camera has found its way far below the surface of the earth, into cavernous depths, and taken the exact stratifications and workings of the deepest mines, by the powerful aid of the lime, electric, and magnesium lights. That all this bodes good cannot, I think, be doubted, inasmuch as it supplies more accurate data to work upon.

But, then, we are met with the objection that pictures and diagrams thus produced are not permanent, but fade and disappear after a few years. But, while they have not the permanence of the fresco or oil painting, they supply to the artist and engraver the highest essential of permanence, the one thing valuable—accuracy; and it is to be hoped that in the progress of discovery this objection will some day be removed by the application of new appliances that will render our pictures more enduring.

After all, while our art is of admitted service in every branch of art and science, it is in taking the "human face divine" that it reigns supreme, and as memorials of affection and family endearment it must ever hold the foremost place. Here I would observe that nothing is better calculated to educate the age to a due appreciation of *chiaroscuro* and relief than photography. Its greatest achievements are attained without the aid of colour, as all the effect of sunlight can be had by black and white—by the proper study of light and shade, as may be seen in the works of the great masters, especially Rembrandt, where the whole palette of the painter consist only of browns, blacks, and whites. A spot of white on the tip of the nose brings more sunlight into one of his paintings than the gaudy cadmium, yellow, and ultramarine of modern artists. If we take white lead, which is the nearest approach to light, it will appear heavy and grey compared with the light on the natural object. Thus the tints of a picture, to produce effect, must be deeper than the natural. The works of the great masters furnish us with many instructive lessons on the successful treatment of the art necessary in the production of a good painting.

Applied to our own art, it may be asked—How is it possible, without the requisite amount of study, to produce a highly-finished or artistic photograph? It is not enough to purchase a camera and lens and fit up a studio on the top of a house, and imagine that this should suffice. Just think of an art-student going about his work in this summary manner! And fancy what a bungle he would make if he tried to paint a picture without any rule to guide him, or sought to dispense with the necessary study and years of laborious application in mastering drawing, composition, and the harmony of colours! Not so with the photographer. What does he care for the rules of art? With his studio, camera, and collodion he is fully equipped—a mode of procedure which reduces our beautiful art to a mere mechanical performance.

In looking over a collection of ordinary views of our interesting natural scenery I do not wonder at our friends of the brush and palette pooh-poohing our work, and saying "Do you call that artistic? Why, the mountains seem made of cast metal! There is no aërial perspective to give distance to the view, and the artificial clouds introduced are never in harmony with the character of the landscape." All this, I am sorry to say, is generally the case, except in a few instances where the work has been done by an artist, who had to wait patiently till the proper effect of light and shade appeared on the view, thus getting rid of the spottiness and excess of detail and securing breadth.

The definition of the term "breadth" involves an apparent paradox. Breadth of light or shadow does not consist of equal light or shadow; that would be flatness. Artistically, breadth is used in contradistinction to spottiness, and a space of equal light, however broad, is but a spot or blot. The most simple arrangement of light and shade may be seen in the works of Collins, Stanfield, and several other painters of coast scenes. The darkest shadow may be placed near the horizon about one-third of the height of the drawing from the base line, and should graduate upwards and downwards in the form of a wedge. A small spot of dark in the foreground will complete the effect. In this dark shadow any form may be indicated—figures, trees, or a city; a single mass of shadow is thrown against a sky, graduating from the horizon. This may be reversed, and a mass of light be relieved from a dark background, as in the cathedrals of Roberts, animals by Landseer, &c. Another simple effect is to be found in the Rembrandt pictures. A small, brilliant spot of light is suddenly graduated to a profound depth of shadow. The brilliancy of the light may be forced by placing a dark figure against a light one. Such are the simple arrangements of light and shadow.

Sir Joshua Reynolds insisted that there should be three lights to produce pictorial effect, the three lights varying in quantity and degree of brilliancy, and so placed as not to form a straight line, but a triangle with unequal sides. This idea is not now so often utilised as formerly. Turner's system is very effective—rearing a dark mass of foliage against light sky, supported by some dark spot in the foreground, which is generally light, but melting into a middle tint, approaching to a deep shadow.

The introduction of figures as an aid to forming a composition seems to be little understood by the majority of photographers. Look at the photographs in our shop windows, and see how all the figures stare at you out of the pictures in statuesque stiffness and without natural motion or attitude, like a file of soldiers. Again: it is one of the rules of art never to have a figure or tree in the centre of the picture, it being a weak pictorial point. Thus, if your subject be a figure, never place it in the middle of the picture, but at one side. "Tread softly!" here exclaims a slave of the black art. "What is the use of making a fuss about art? I am not paid like the landscape painter, who thinks nothing of £500 for a single picture, while I dare not ask as many pence. Neither can I afford to go to a school of art and study, as he must. My work is not permanent, all the processes being evanescent and disappear in a short time."

Even the paper process when first tried was believed to be permanent, but in this we have all been disappointed. The carbon process at present is considered by the profession to be perfectly stable, as the ingredients consist of carbon, glue, and crimson lake. The carbon will stand, but the lake will gradually disappear and the glue will crack and be affected by the action of the atmosphere.

The mechanical process of Mr. Woodbury has made its mark, the number of books and papers illustrated by it showing the features of our most eminent men. But is it permanent, one of the colours used being of a fugitive character? Not so, however, with the print given with an almanac this year, it being printed in fatty ink, and not on a glazed paper, thus doing away with the vulgar, patent-leather surface.

The blacklead pencil has now become a powerful aid to our art in removing defects, the customary fashion being to retouch all work sent out, effacing all the delicate shades or half-tones, and leaving the face, like that of a wax doll, without impression or character. The manifest evils of this system are not far to look for. In many instances retouching has been carried to the extent of almost making it impossible to recognise the original by the photograph.

Allow me to say this is no light matter nowadays, when we remember that the photograph is, in the hands of the detective, an almost indispensable aid in the recognition and detection of criminals, and the peculiar and sinister aspect of the features of this class are just those the retoucher would most likely cancel.

Just think of the high value Mr. George Ewing, of our city, would have placed on the possession of an untouched photograph of our national poet, Burns, when preparing his model for the statue erected in George-square, and of the real advantage it would have given him of giving a faithful expression of the poet's features. In fact, retouching in every case should be cautiously gone about, and care taken in no instance to "improve" the picture at the expense of accuracy. At the recent Edinburgh exhibition we had some fine specimens of what may be accomplished in our art, especially in the works of M. Kareline, the eminent Russian photographer, about which Mr. Norman Macbeth has given us a very able criticism in THE BRITISH JOURNAL OF PHOTOGRAPHY of last week, and which contains valuable hints we should all study. There is, however, one remarkable fact in connection with these pictures—the sitter in all the most artistic groups appears to be dressed for the picture, so that the arrangement to produce effect may be secured. We also find that a number of the figures are placed with their faces turned away from view. Now, one difficulty we all find in taking groups is that every sitter insists on having his face, and not the back of the head, represented. In Kareline's pictures, and in which, to my mind, he is peculiar, he exhibits his chief excellence in the lighting, by which such startling effects are produced. In my opinion, the bright lights are got by touching on the front and back of the negative, and also by sunning down the middle tints. It is also evident, I think, that some of the prints are from composition negatives, or printed from more than one negative. Still, however, a great art triumph has been achieved.

Above all things it must be hailed as a hopeful sign that our art is not lagging behind in progressive improvement—a result no doubt due to the immense competition now existing between nations as well as individual artists, and to the new objects of interest to which it has been applied. And while art and science go hand in hand in multiplying objects of beauty and the wellbeing of nations and individuals, and while schools of design, art, institutions, and exhibitions, in which decorative and architectural art are employed in the embellishment of our cities, the photographer must ever take an important lead in the movement.

This brings me to the intimate relation between our art and painting, sculpture, and architecture. It is admitted by the best art-critics that as a nation we are making some progress in these arts, and this is attributed to the increased attention we have been giving to the matchless works of antiquity, and the discovery of the rules which constitute their excellence. Here photography reproduces the work as the artist left it, and furnishes to every school a teacher and guide. In this sense art-genius never dies, and the past and present are united.

What a panorama the photographer can give of all that is admirable in every part of the world—the classic remains of Egypt, Greece, and Rome, the palaces, canals, and gondolas of Venice—and bring to the light of day the buried art-treasures and architecture of the engulphed cities of Herculaneum and Pompeii! And from the new world, America, from Australia, the East and West Indies, and over the burning plains of Africa and India, it brings to our firesides exact copies of their gorgeous temples, rich floral growths, immense water-courses, and all that is calculated to bewilder the mind and eye, and thus supply the advantages of travel and adventure to those who remain in ease at home.

But it is as an aid to the arts I have mentioned that all this is chiefly valuable; for, besides copies of what has been already done, the groundwork of suggestiveness is furnished by which new systems may be planned and improvements adopted. It is only by such means we can hope to see public taste educated, and our cities and households beautified and decorated.

Nor is this less true of the sciences that bear on industrial accumulation. If our nation is to hold its advanced position it must avail itself of every aid that points to improvement, and no other art is better fitted to ensure correct data than photography, or one that can be applied to a wider range of subjects. Even the aid supplied by the microscope in physiological research would be of little practical general use but for the intervention of the photographer—a proof that our art can deal with the most minute as well as with objects of the greatest magnitude.

J. Urie, Jun.

FOREIGN NOTES AND NEWS.

A Plate-Cleaning Machine.—A Photographic Riddle.—The Largest Picture in the World.—Dr. Vogel's Modification of Eder and Tóth's Intensification by Lead Process.—Photographic Society of France.—French Journalism.

Herr Grüne, of Berlin, has invented a machine for cleaning plates. The plate is laid horizontally upon a board supported upon two cradle props, so that it can be pushed backwards and forwards in every direction. A circular brush, having a diameter of about eight inches and a width of from one to two inches, is placed over the board and driven by a crank. A mixture of water and silica should be spread over the plate before the latter is fixed upon the board, which is moved about as the wheel is driven round, so that the brush may pass over the whole surface of the plate. The plate is then allowed to become thoroughly dry, after which the dust is removed with a clean linen rag, and the plate is ready for use. When exhibiting his machine Herr Grüne placed in it several plates intentionally covered with greasy spots and marks, and when removed they appeared to be perfectly clean. He further assures us that with this machine the oldest, dirtiest, and even mouldy plates may with little trouble be made quite usable. He, however, remarks that the silica used should be previously made red hot, in order to purify it from any organic admixture. It should then be shaken up with much water in order to throw down any grains of sand, after which the water at the top should be poured off and the pulp which has risen to the top used. The lower sediment should be thrown away.

Herr Reichard, who has had one of these machines in use for some weeks, speaks highly of it. We understand the machine is to be manufactured for the trade, though whether it will ever supersede polishing by hand is a different question. It may, however, do the first or roughest part of the work, leaving only the final rubbing-up to be done by hand.

At a recent meeting of the Berlin Photographic Society Herr Richter "perpetrated" the following riddle:—How can one produce at night a positive picture from a negative in about half a-minute without using artificial light or special apparatus? Answer: Hold a negative against the light of a lamp, or soforth, and look through it; then shut your eyes for thirty seconds, and in the interval a positive picture will have been produced in your eyes. If the plate be kept quite still and the observer's head fixed in one position, and if the eyelids have been moistened to prevent winking, the image obtained will be so sharp that one will be able to recognise the person. In this way Herr Richter has recognised persons from the negative whom he did not know. It is due to Mr. W. B. Woodbury to state that this method of examining a picture was discovered, and published by him, several years ago.

Mr. Gutekunst, of Philadelphia, has produced a photograph of the site of the late exhibition there, which is said to be the largest in the world. It is ten feet long and eighteen inches high, and was printed from seven separate negatives. The paper was first silvered, in order to accomplish which a special apparatus had to be constructed, and one negative being laid upon one end of the strip the rest was covered up until that was printed, then the second was printed along side, and so on. This was successfully accomplished so as to show no line where the different negatives join, nor any appreciable difference in the depth of printing—an undertaking so far accompanied by great difficulty. The picture was then toned, great care being required to prevent one end from coming out red and the other blue; but this obstacle was also successfully overcome, and, that done, the subsequent washing and mounting was comparatively easy.

Dr. Vogel recommends the following modification of Herren Eder and Tóth's lead intensification process. He took several negatives, gave them a short exposure in order to get the lines as clear as possible, developed and fixed without intensifying, and washed well. As a test of the thoroughness of the washing a few drops of water may be allowed to fall from the plate into a little diluted yellow solution of tincture of iodine, and if this be not bleached the plate is cleaned. He then laid the plate, for ten or fifteen minutes, in a filtered solution of four parts of sulphate of lead and six of red prussiate of potash in 100 of distilled water. There it became a whitish-yellow, and consisted of ferrocyanide of lead and ferrocyanide of silver. The plate could now be treated in various ways:—First: it might be coated with a solution of one part of red chromate of potassium in ten parts of water. This solution should be mixed with a quarter of its volume of ammonia. In this way the lead salt is converted into chromate of lead—that is, *chrome yellow*—which is dense enough for many purposes, and may even be used for pictures in half-tone. The plate is then washed again, dried, and varnished. The second method of treatment is to coat the plate with a mixture of one part of the before-mentioned mixture of chromate of potassium and one part of ammonia. This produces *chrome orange*, which affords a far more powerful covering, and is excellent for linear reproductions. Wash, dry, and varnish as above. These modifications of Eder and Tóth's process Dr. Vogel has employed with good results. Thirdly: if a perfectly opaque covering be wished, then pour sulphide of ammonium over the plate after it has been removed from the lead bath and intensified. It then becomes intensely black. Of the rents of which others had said so much Dr. Vogel had seen nothing. Of the lighting of fogged plates by hyposulphite of soda after the lead bath, as recommended by Eder and Tóth, Dr. Vogel had experienced no good results. If the plate be not absolutely clear after the fixing, he recommends that it be coated with a solution of one part of iodine and one of iodide of potassium in 200 parts of water, and then fixed again.

The Photographic Society of France has just held its annual general meeting. The subjects brought before the members were those which have been lately so thoroughly treated in The British Journal of Photography, comprising, among others, the composition of a matt varnish, which, modified by Mr. W. J. Newton, was published in The British Journal Photographic Almanac for 1876, Mr. Newton's modification forming, in the estimation of M. Perrot, an improvement upon the original formula. The description of Mr. Newton's matt varnish was given in page 58 of the present volume. Another subject to which prominent attention was given was the hydrosulphite developer, concerning which, we need scarcely remind our readers, several articles have recently appeared in this Journal. The Treasurer's report showed that, in a pecuniary sense, the Society was in a flourishing condition, the receipts during the last year being fr. 14,507·75, and the expenditure fr. 6,620·40; thus showing a balance of fr. 7,887·35. It is singular that so influential a Society should not have more original communications at their meetings. We observe that M. Peligot has again been elected President for the ensuing year.

While speaking of the Photographic Society of France, it is a matter of great surprise that the organ of this Society (the *Bulletin de la Société Française)* does not publish more original communications than are to be found in its pages. To this it may be retorted that it is not worse with the organ of the Photographic Society of Great Britain; but to which we reply that there are other journals published in this country from which photographers are made acquainted with all that is transpiring in connection with our art-science, and are, besides, treated to numerous articles descriptive of the results of original research—a state of matters which does not prevail in France, if we are to judge by such journals, including the *Bulletin*, which reach us from across the channel. Perhaps France will wake up some day, and emulate its English and German neighbours.

Our Editorial Table.

The Autotype Manual.—Sixth Edition.

Nearly a year has elapsed since we directed attention to this popular *Manual*, on the publication of the fifth edition. Such, it appears, has been the rapidity of the sale of that issue, that the editor and publishers have been compelled to issue another edition; and, as carbon printing is at the present time progressing with unusual speed, advantage has been taken to revise the whole and bring up the information to the latest possible date.

We have within the past few weeks directed attention to the subject of the reticulation of carbon prints. This was long a sore annoyance to the carbon printer, and seemed as if it would baffle his powers of discovery; but, owing to investigations initiated and carefully conducted at the autotype factory, the cause of this evil was discovered, and it now belongs to things of the past. In the chapter devoted to failures this kind of reticulation receives ample and plain treatment.

In the same chapter we find other failures dealt with in an equally straightforward manner. If the half-tints suffer or are lost the cause, we are informed, is to be found occasionally in under-exposure, and sometimes to the water being used too hot when commencing the development. If the picture washes up from the collodionised glass, it is an indication that the collodion has not been allowed to set sufficiently before being immersed in the hot water. To avoid this evil care must be taken that the collodion surface be not broken, as this enables the water to get underneath, by which the picture is loosened from the glass. Roughening of the margins of the plate upon which the picture is developed also tends to prevent this. If the picture obstinately refuse to leave the glass the fault is due entirely to the waxing of the glass. The remedy consists in making use of a solution of pure beeswax in pure benzole, and not polishing off the wax too closely, especially if the plates be new. An old plate, it seems, will sometimes allow of a picture being stripped off its surface without its being re-waxed at all; but new glass must have a sufficiency of wax left on.

This *Manual* will prove an admirable and trusty *vade mecum* to the photographer who, desiring to keep up with the times, seeks to acquire a practical knowledge of carbon printing in all its phases; for it takes him by the hand at the very threshhold of his inquiry, and leads him step by step over the whole ground now taken by pigment printing in its various applications to ivory, opal glass, plain glass, paper, and canvas.

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Watson's Catalogue of Lenses, Cameras, and Apparatus.

It is a boon of no inconsiderable value that photographers are placed in the position of being able to procure second-hand instruments of undoubted excellence at a charge much below the new or catalogue price of such apparatus. It is a boon, too, of which photographers do not appear to be slow to avail themselves, if we can estimate this by the compendious catalogues which from time to time are sent to us.

Of such catalogues the latest is one just issued by Messrs. Watson and Son, opticians, High Holborn, which contains a complete list of lenses of almost every kind and by every known maker, besides cameras of every form—from the huge studio camera down to that design which folds up so as to be capable of being stored away in the pocket—stands, printing-frames, tents, baths, presses, *et hoc genus omne*. This comprehensive catalogue cannot fail to prove both interesting and instructive to those who stand in need of lenses, cameras, or apparatus.

Meetings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The monthly meeting of this Society was held on Thursday, the 1st instant,—the Rev. F. F. Statham, M.A., President, in the chair.

The following new members were elected:—Messrs. E. D. Lavender, Charles Bennett, and W. Atkins.

The **Chairman** said that, previous to calling upon Mr. P. Mawdsley to read his paper, he would ask Mr. William Brooks to make some observations respecting a series of experiments he had recently been trying in connection with odic or magnetic photography.

Mr. Brooks then made a communication, which will be found on page 112.

It was agreed that no discussion should take place on this subject until a subsequent meeting, when it would be again brought forward. The thanks of the Society were in the meantime awarded to Mr. Brooks.

Mr. P. Mawdsley then read a paper on *The Collodio-Bromide Emulsion: Some of its Applications.* [See page 112.] During the reading of the paper Mr. Mawdsley illustrated his subject by handing among the members for examination several specimens illustrating the various topics introduced in the paper.

Mr. J. T. **Taylor** having observed that the application of the emulsion process as a substitute for the ordinary wet collodion bath process had been overlooked,

Mr. **Mawdsley** said he was aware of the omission, but he considered that the moist process to which he had alluded in his paper would form a substitute such as that spoken of, more especially as the plates prepared by its means possessed a greater degree of sensitiveness than wet collodion.

Mr. E. W. **Foxlee** stated that, some time ago, he was endeavouring to produce an enlarged negative of eighteen inches direct by one operation from a small negative of three inches, by having recourse to the nitric acid process. He used a bromised plate prepared, not by an emulsion, but in a silver bath, and he found that it was impossible to bring the negative up to printing density. He inquired if any member could indicate the cause of his failure.

Mr. **Mawdsley** was not familiar with the bath process; it was a very long time since he had given it up.

Mr. **Nesbitt** said that the want of success experienced by Mr. Foxlee arose from the presence of acid in the film. After treatment with the nitric acid the film should be well washed, and a large proportion of ammonia used in the developer.

The questions of the sensitiveness of wet and dry emulsion, of the amenability of the atoms of bromide of silver to the action of the developer, and of the fineness of the deposit in an emulsion negative, having been raised,

Mr. L. **Warnerke** said that there was no doubt that emulsion plates could be made to be quite as sensitive when used dry as if they were exposed in a wet state; that the amenability of the film to the action of the developer was not influenced by its having been dried previous to the application of the developer. The image obtained by an emulsion process was much finer than if the ordinary wet collodion process were employed.

A conversational discussion then took place on the subject of pinholes in gelatine and collodion emulsion negatives, in which Messrs. Warnerke, York, Kennett, Brooks, and others took part, but nothing new was elicited as to the cause of these spots.

On the subject of intensity,

Mr. **Brooks** said he obtained great density by washing first with alcohol and then with ale, afterwards applying the alkaline developer. For transparencies he usually diluted the emulsion to a considerable extent so as to make it exceedingly thin, and organified the plate between exposure and development.

After a vote of thanks to Mr. Mawdsley the meeting was adjourned.

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GLASGOW PHOTOGRAPHIC ASSOCIATION.

A general meeting of this Association was held on Wednesday evening, the 28th ult., in the Religious Institution Rooms,—J. J. Long, Esq., Vice-President, in the chair.

The **Chairman**, in opening the meeting, begged to be excused for being absent for such a length of time. Having another meeting on the same evening he was prevented from being with the members as often as he would like.

Mr. **Paton**, of Greenock, showed some cabinet and whole-plate specimens in carbon with accompanying negatives *à la* Kareline, one of them being an exceedingly close and clever imitation of the Russian's prize picture. There was no double printing, as could be perceived from the negatives, which were direct and untouched. They were taken, he explained, by Ross's smallest *carte* lens and a No. 2 Dallmeyer's lens, the light all coming from the side through an imitation room window, his greatest difficulty being to tone down the light sufficiently, especially the top light. In order to prevent the window curtains coming out a mass of white he had dyed them with orange chrome to about a canary colour; and although these results were his first trials he had experienced no particular difficulty in producing them. He intended prosecuting his experiments in this direction further, as he considered these photographs something new, and much more pleasing than the usual style of group, &c.

The pictures were highly commended by all present.

The **Chairman** proposed that a hearty vote of thanks should be accorded to Mr. Paton, and he felt sure all present would be delighted at his success in producing pictures *à la* Kareline. Judging from Mr. Paton's first attempts, which were really excellent, he might yet be able to reach the acme of perfection in this kind of portraiture.

The Secretary then drew attention to M. Klary's circular regarding his mode of lighting, and proposed that his book should be bought by the Association.

Mr. **Dodds** asked if they would be at liberty to use *one* copy all round.

Being a published work it was thought no valid objection could be put forward against this proposal, and it was finally agreed to procure one copy for the use of the members of the Association.

Mr. G. **Mason** intimated that he had received from M. Klary a number of his photographs, which he would exhibit at the next meeting.

Mr. **Johnston** then showed, and explained the use of, a model automatic shutter he had constructed for giving quick and ordinary exposures, also the giving of sky less, and foreground more, exposure, and for equal exposure of both if required.

This was considered a very ingenious piece of mechanism, but the action of opening and shutting the shutters caused such a vibration that fears were expressed it would prove a very great objection to its use, though it was pointed out that it might be made of lighter materials, and the vibration thus got rid of to a certain extent.

A vote of thanks was accorded to Mr. Johnston.

The Secretary drew attention to four cases of Mr. A. L. Henderson's enamels, explaining that they were intended for the Edinburgh exhibition, but had, unfortunately, arrived after its close. The verdict of their Edinburgh friends was that, if they had arrived in time for exhibition, they would undoubtedly have won the silver medal. Being in correspondence with the Secretary of the Edinburgh Photographic Society he had requested that they might send them for the inspection of their Glasgow brethren, to which they had at once kindly complied. Being subject to a patent right and somewhat of a secret process no definite idea could be formed as to how they were produced, except from the descriptive notice which had appeared in The British Journal of Photography some time ago, where it was explained it was a film process, the film being rendered indestructible by fire.

The specimens were much admired, and a vote of thanks was accorded to the Edinburgh Photographic Society for sending them, and, also, to Mr. Henderson for allowing them to be exhibited.

The Chairman considered the results most beautiful and the process one that would yet be more extensively worked. One great quality he considered was the perfect durability and permanence of pictures produced that way—a desideratum in photography. He called upon Mr. J. Urie, Jun., to read his paper on *Photography as an Aid to the Arts and Sciences.* [See page 113.]

After the paper had been read,

The Chairman said the paper was an able one and of great breadth and fulness, though there was one subject the author had not touched upon, namely, the production of photographs in natural colours. No advance seemed to have been made in that department, though by some, he believed, it was thought to be yet possible. Personally, he feared it would be like the philosopher's stone—turn all the baser metals into gold; but the attempt to find it out would prove unavailing.

The Secretary commended Mr. Urie on his first appearance, and for such a young man thought the paper was eloquently written and well read. As the Chairman had said, it went over a great surface, nothing of importance having been left out, save, perhaps, that on photography in natural colours. He remembered that, sixteen years ago, an American, of the name of Hill, had declared he had produced photographs in natural colours, but they had never yet got across the Atlantic, he was sorry to say. There were some said to be in the Paris Exhibition of 1867; but, judging from the fact that they were kept in a closed case in a dark corner, and only shown at stated times to a very select few, he was inclined to doubt the truth of the assertion that they were photographs in natural colours. With Mr. Urie he considered the Woodburytype a useful process which would yet be more and more used, the results, he thought, being equal to those produced by any other process.

There being no more business, the Chairman proposed a hearty vote of thanks to Mr. Urie for his very able and interesting paper, which, seeing he was such a young man, augured well for the future.

A vote of thanks to the Chairman brought the meeting to a close.

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PHOTOGRAPHIC SOCIETY OF COLOGNE.

Three meetings of this Society are reported in the *Monatsblätter*, but at none of them did anything transpire calling for remark, the business on hand being principally the preliminary arrangements as to rules of membership, election of office-bearers, &c.

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VIENNA PHOTOGRAPHIC SOCIETY.

A meeting of this Society was held on the 16th ult.,—Dr. Hornig, President, occupying the chair. After the usual formalities of reading the minutes of the previous meeting, and the admission of new members were concluded,

The President said he had received a letter from the Austrian Commissioner at Philadelphia announcing the award of a medal to the Photographic Society of Vienna. He also intimated the formation of a new photographic society at Gotha, to be called the Thuringian Photographic Society. He then laid on the table a series of stereoscopic pictures, being photographs of natives and landscapes in Parana (South America). Copies of this series were exhibited at the exhibition at Brussels twelve months since, where they attracted some notice.

Herr Haakman, President of the Photographic Society of Amsterdam, sent some cabinet and stereoscopic views to show the capabilities of the dry process as recently described by him.

Herr Max Jaffé exhibited a table of colours and the negatives taken from them, showing the actinic power of the various colours, and read a paper on the production of inimitable papers of value (bank notes, cheques, &c.).

Baron Von Schwarz Senborn asked whether Herr Jaffé had brought his proposals under the notice of the National Bank or the State Finance Committee.

Herr Jaffe replied that he had, and that the National Bank had replied that it was not in a position to give his proposition a trial, but that from the Finance Committee he had, as yet, received no reply.

Baron Von Schwarz Senborn then said he had lately visited the great glass manufactory of Mr. Gaffield, at Boston, and had an opportunity of making some observations on the action of light upon glass, which he would be ready to communicate at the next meeting of the Society, when he hoped to have some specimens to make his meaning more intelligible. [This proposal was greeted with applause].

Dr. J. M. Eder then called attention to the table of the different conditions of the intensity of the light on different days of the year prepared for Vienna by Dr. J. Holitschek. He spoke highly of the advantages of such tables to photographers, especially to landscape photographers, and thought the table in question should be published.

Herr von Stefanowski read a paper on vignetting, whereupon

Herr Luckhardt remarked that a method of producing effects similar to Vanderweyde portraits had been recently patented in England which he had used for years, namely, a negative made from shagreen paper or bookbinders' cotton, from which to print in granular backgrounds.

Some collodion cotton prepared by Dr. Heid was then placed on the table, and the members were invited to take a little of it home with them for experimental purposes.

To the question—"What is the most radical method of eliminating hyposulphite of soda from silver prints, and increasing the durability of the prints?"

The President replied that the subject had already been discussed over and over again at great length.

Herr Schrank expressed a wish that some one would try the method proposed by Dr. Reissig for removing the last trace of the hyposulphite of soda from the picture by means of a stream of electricity.

The following question was found in the question box:—"Has any one heated his dark room with a stove? and, if so, does it exercise any injurious influence upon the operations?"

Herr Jenik remarked that he had never observed any bad effects caused by heating his dark room with a gas stove.

Herr Gertinger said his experience had been the same.

The President thought it depended a good deal upon the construction of the stove, and whether the gas was all perfectly consumed.

The meeting was adjourned shortly afterwards.

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Correspondence.

General Meeting of the Photographic Society of France.—Favourable Report of the Commission on the New Washing Apparatus.—Patent Swindlers.—Carbon Tissue.—Presentation of Proofs.—M. Flament on Reducing Nitrate of Silver to a Metallic State.—The Lens ("Trousse") of M. Darlot.

The general meeting of the Photographic Society of France took place on Friday, the 2nd instant,—M. Peligot in the chair. The meeting was poorly attended, and the *ordre du jour* very scanty of subjects for discussion or comment. It appeared as if the continual bad weather which we have had for the last few weeks had penetrated to the soul of all, stifling, as it were, inventive genius as well as calming the natural desire of all to take part in meetings, whether scientific or otherwise.

M. Franck de Villecholle read the report of the Commission which was formed to give their appreciation on the new washing machine which I described in The British Journal of Photography, page 69. The Commission were of opinion that the machine was a very useful invention and would render great service to photography, and proposed a little modification in the paddles of the water-wheel which are to keep the proofs in motion. This modification consists in curving them at the end a little more than as proposed by the inventor, because the Commission judged that, if the paddles as made by M. Collet were allowed to plunge a little too deep into the water, creases were made in the proofs; whereas by curving them a little more that inconvenience would be avoided.

Since I wrote upon this apparatus I have seen it at work, and proposed to the owner (a photographer) to attach to the ends of the paddles a flat piece of india-rubber of a spatula-like form, in order to prevent the breaking, cracking, or folding of the proofs during washing. The photographer tells me "it has succeeded admirably." I have, therefore, no hesitation in counselling English photographers to make a trial of this new washing-tray. Any tinman would make the overshot wheel at a very little expense; as for the trays, they could be procured at the ironmonger's. Time is so valuable and labour so dear that I have no doubt photographers will be happy to employ the new apparatus, which was invented for the saving of both.

A very interesting discussion took place as to whether it was advisable for the *Chambre Syndicale de la Photographie* to denounce all patents which were taken out for inventions (let it be said "supposed" inventions) that had been known and even worked by one or other of the fraternity for a length of time; in other words, to find a flaw in all patents for the advantage of the million.

M. Despaquis objected most energetically to this, as he called it a secret tribunal which, without having a right to pronounce a public judgment, could, by giving a private opinion, materially injure and, perhaps, by personal antagonism, put under a bushel an invention or idea which would otherwise be of service to humanity.

A member of the Syndic, in reply, gave a rapid history of what were the ideas of the Syndic on that subject, and showed the fallacy of M. Despaquis' fears. He explained how photographers were open to be barefacedly robbed by certain swindlers who had taken out a patent in order to speculate upon public credulity. One of the class (said he) entered the other day into a photographic establishment, and, having asked for the proprietor, said:—"You employ such and such a process; do you not know that I have a patent for it?" "Impossible," answered the other; "it was employed by my father twenty years ago." "Never mind; here is my patent, and I will now enter an action against you unless you purchase a license for £20." The poor victim prefers rather to pay the sum than to have a law suit, with its train of expenses and loss of time. "*Un mauvais arrangement vaut mieux que le meilleur procès*" thinks he, and the trick is played. Many members gave it as their opinion that the *Chambre Syndicale* were perfectly justified in trying to put a stop to such unlawful doings, the more so that the Photographic Society of France, having been formed only for the advancement of photography in a scientific and artistic point of view, always abstained from intermeddling with business matters, or recommending any establishment or process whatever, and no aid can or must be expected from them.

Several members who had received a specimen sheet of M. Braun's carbon tissue at the last meeting brought the proof they had obtained for the appreciation of the Society. These proofs were perfect in every sense. M. Braun was congratulated on the progress he had made by the introduction of a new source of wealth which he had by his perseverance given to his native country, which up to the present time had been obliged to be tributary to foreign countries for the best article.

M. Ziegler made a presentation of some very fine proofs, the reproductions of some of the best pictures of the *Musèe de Munich*. They were silver prints.

M. Gillot presented a collection of phototypographic prints having half-tones, which excited great curiosity.

The meeting was then adjourned.

M. Flamant proposes, in order to reduce the silver of old negative baths to a metallic state, to precipitate them into a chloride by chlorhydric acid, melt it in a crucible with one part of chloride to two parts of carbonate of soda, and then to convert it into pure nitrate. Many photographers unacquainted with chemical manipulation might try his formula and succeed; but really it is like giving three farthings for a halfpenny. In the present day amateur writers must not imagine that photographers are without judgment, and that they can write anything passing through their mind, without control and without due deliberation as to its value. In the first place this writer proposes ordinary chlorhydric acid. Why not common salt? It would be as good and inexpensive. M. Flamant takes nitrate of silver solutions and precipitates them into chloride to be melted in a crucible, which is a waste of time and unnecessary expense, and, what is more, a loss of the precious metal. Silver as an oxide or in a metallic state can so easily and cheaply be withdrawn from nitrate solutions, and the manner of doing so is so well known, that it is almost daring to put it down again on paper. Put all the nitrate of silver solutions into a large glass bottle, and pour into it a strong solution of potash. A brown-black precipitate of oxide of silver falls. Potash is added until all the silver has been converted. Very little washing is necessary to eliminate the excess of potash, together with the nitrate of potash formed. The last washing is to be made with distilled water. The oxide can now be dissolved in pure nitric acid if nitrate of silver be required, or melted in a crucible should it be thought fit to sell the ingot.

The question of the choice of lenses is one of vital importance to the amateur, especially if he occupy himself with landscape work while travelling from place to place. M. Davanne has written very ably on this subject in his new book on the progress made in photography during the last few years. He has mentioned a universal set of lenses as made by the celebrated house of Darlot, of Paris. As I have been able to judge of the value of the finish and commodity of that set of lenses myself, I quote from the author:—

> "We can mention equally as very convenient the *trousse universalle de M. Darlot*, for the taking of landscapes. This lens comprises a system of lenses with special curves, all of which can be screwed upon the same brass frame, and be used either singly or combined together, and so realise as nearly as possible the desired focus. When these lenses are employed combined together the focal length of the combination can be found by adding the focus of the two lenses and dividing it by four. Thus, if a ten-inch focus lens be placed on the outside facing the landscape, and an eight-inch inside facing the focussing-glass, the two being added together make eighteen, which, being divided by four, leaves four and a-half inches in focus.

I made all my views with one of these combination lenses when I paid a flying visit to Old England, and am quite satisfied with the results obtained. The six lenses permitted me to obtain almost any focus from three to sixteen inches. It was as if I carried fifteen lenses in my pocket. Whenever I placed my camera stand in a favourable place I never had to carry it forward or take it back in order that the image might be of the right size on the ground glass. I obtained this result by the combination of lenses alone. In mountainous districts this combination lens can hardly be replaced by any other in the market; therefore, I am glad to draw the attention of amateurs and others to its existence. E. STEBBING, *Prof.*

3, *Place Bréda, Paris, March* 5, 1877.

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EMULSIONS.

To the EDITORS.

GENTLEMEN,—I was aware that collodion emulsion had been proved to be as sensitive as ordinary wet collodion, as Mr. H. Kerr states in your last issue, and remember having read about the trials and instantaneous pictures referred to by him.

We all know Colonel Stuart Wortley to be *au fait* in the manipulation of the plates prepared by his formula, and Mr. R. M. Gordon more than hints that, in other hands, the wet process might have had the advantage. However this may be, I have believed that gelatine emulsion *may* be made (of course, not necessarily) more sensitive than either wet or dry collodion, prepared by the published processes, and especially so in a practical sense.

I am beginning to think that collodion emulsion may yet be made as sensitive, practically too, as any of the gelatine emulsions of which the formulæ have been published.

The formula by which I have prepared the highly-sensitive collodion emulsion, to which the "Peripatetic Photographer" refers, does not owe its existence to any researches of my own. Any credit, therefore, which may attach to it would be due to my informant; my claim to a share of the "gratitude" is consequently very slight indeed. I have no doubt that the gentleman to whom I refer will allow me to accede to the "Peripatetic Photographer's" request, and, also, to accociate his name with the formula, though I believe he does not attach sufficient importance to it to publish it himself. Perhaps there is nothing which can be called "new" in the method of preparation of the emulsion, though probably the manner of adding the albumen may be new to at least most of us. When I have obtained permission to do so I shall be happy to send the formula and method of preparation.

I have made some more gelatine emulsions with zinc bromide, taking care only to warm them slightly during five hours before washing the free silver and salts out of them; still the plates become discoloured on development from some cause or other, though apparently to a less degree than the others mentioned in my last letter. I am going to make another emulsion with bromide dissolved in rectified alcohol, and may get a clearer insight as to the cause. Plates prepared by another formula do not discolour with the developer used.

These last two emulsions are even less sensitive than the first two I made. Perhaps the excess of silver acted more energetically on the heated emulsions. On comparing results made with the "pyroxylinised" and the plain emulsions I find that the former has, in every case, a slight advantage, especially when using a paraffine lamp as the source of light. In plates exposed in the camera the effect is less apparent, and, doubtless, is at least partly due to the greater vigour of the result, the pyroxyline extract tending to filling up of the lights and a cold black tone by reflected light, whereas the deposit of the plain gelatine plates is more delicate and brown by reflected light. I cannot account for the insensitiveness of the plates; perhaps when I get rid of this discolouration I shall secure widely different results. I may say that I was surprised to see how much the orange-coloured effect disappeared on fixing. As yet I have only succeeded in making the zinc gelatine emulsions about one-fourth as sensitive as emulsion prepared with ammonium bromide.

I have tried the addition of sulphate of magnesia to the water used for development, and find it apparently a cure for the blisters which occurred with the zinc plates. I know that soft water can be used with a sound plate, as I have invariably used it; but I might, doubtless, have avoided many a blistered plate had the salts been utilised before. This being so, I think that sulphate of magnesia should be looked upon rather as a preventive than soft water as the cause of blisters; that is, we should not blame the soft water but the plates, the blistering propensities of which we may cure by making the water hard. I believe the sulphate is not credited with any specific action of its own on the gelatine film; its action is simply mechanical.

I remember having suggested in your pages that the carbonate of ammonia developer may cause blisters in a gelatine plate through its greater density than the washing water used (though a plate need not blister under these circumstances). If I had proceeded a step further, and used hard water, I believe blisters from this cause would have ceased. It will be seen from the above that I think more or less faulty plates can be washed with hard water.

The more salts, in reason, there are dissolved in the water used for moistening, developing, and washing, the more nearly will the density of the developer, the washing water, and the fixing solution agree, consequently there will be greater immunity from blisters. I believe we may trace the evil effects some have experienced when using alcoholic solution of pyro. to inequality of density of the liquids used.

Plates are found to blister at different stages of the development—very often not till the developer is washed off, and sometimes during development. In these cases I believe that liquid of an equal density used throughout the operations would prevent blisters occuring. Sometimes we have plates which expand on first wetting them with water; these have been prepared with emulsions in an advanced stage of decomposition, though it may give no evidence of its state to the senses of sight or smell, and the effect is quite different to the "wrinkling." Plates in this condition are useless, unless to try the patience of the makers of them.

I am sorry that Mr. Gray has not yet seen fit to give us an account of his method of making an alcoholic emulsion, as I am persuaded that gelatine emulsion has, in this condition, some peculiar vagaries not easily to be explained.—I am, yours, &c., Herbert B. Berkeley.

Cotheridge Court, Worcester, March 7, 1877.

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"CRACKED VARNISH."

To the Editors.

Gentlemen,—Our attention has just been directed to a paragraph headed "Cracked Picture Varnish," complaining of some mastic varnish purchased from us. The artist appears to have brought trouble on himself by want of knowledge. The picture was varnished before it became thoroughly hard; hence the cracking. Also, from the difficulty he found in laying it on, we judge that he charged the brush too much. We should certainly not add to our reputation by making the varnish thinner. The irridescent patches are caused by damp, which it was the artist's business to guard against. The varnish may be easily removed by friction. Had the artist inquired at either of our places of business he could at once have been furnished with all necessary information.—We are, yours, &c., Geo. Rowney and Co.

10 *and* 11, *Percy-street, London, W.,*
March 2, 1877.

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DIALYSIS *VERSUS* WASHING.

To the Editors.

Gentlemen,—In reference to a communication from "F. S. K" on the above subject, in last week's issue, the experiment there detailed is not, I think, at all conclusive of the superiority in keeping qualities conferred by washing over dialysis. If one portion of the emulsion had been dialysed and the other washed, and both laid aside until it was seen which kept the longer, the experiment would have been more practical and to the point. It would be a pity that this very easy and simple process should be cast in the shade by the more troublesome and tedious process of washing, without sufficient reason.

I dialyse nearly all the emulsions I make, and, with the addition of four or five drops of essence of cloves per ounce, find they keep perfectly for at least six months, even in summer, and this is long enough for all practical purposes. But if by washing instead, gelatine emulsions can be made to keep longer than the above, our thanks will be due to "F. S. K." or anyone else who proves it.—I am, yours, &c., L. S. D.

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CARBON IN PRACTICE.

To the Editors.

Gentlemen,—I think what I saw on Saturday last cannot be too widely known.

Mr. Witcomb is lessee for Salisbury of the Lambertype process, and in order to test the system (he calls it "chromotype") I handed to him, on Friday night last, some of my own negatives, which he had never seen before. On Saturday morning I went to his studio, and he was good enough to show me the whole performance.

I have been told by many that, seeing nothing whatever during the printing part of the affair, there are sure to be many failures. To this I must decidedly object; for, if properly managed, there ought to be absolutely (unless by accident) *none.*

A youth, sixteen years of age, had the management of the production of the prints. Previous to the commencement of the trial, *which was for truth and rapidity,* a young lady had had two negatives taken; and the experiment was made on four negatives, *all perfectly unknown* to Mr. Witcomb or his boy.

At 10.55 I saw my two negatives put into the printing-frames. I saw them exposed, developed, and finished according to the instructions given in your Journal, and they were delivered to me by Mr. Witcomb as *finished prints*—all except trimming and mounting—at 12.12, exactly one hour and seventeen minutes from the commencement of the operation.

I sent one of them by the afternoon post (2.45) to Mr. George Avery, of Tunbridge, who had raised questions as regards rapidity. But I ask—Can any other method that I have ever heard of come up to this in case of great necessity? A boy—a real boy—did the principal part of the business, namely, the exposure. When asked—"How many tints will you give to these negatives?" he said—"Two and a-half tints to one, and three and a-half to the other." Both came out equally well.

The portraits were similarly successful, but, naturally, a little behind the others, having to be dried, varnished, &c. Nevertheless they were ready to be transferred before I left at 12.30, and five of them were sent off by the six o'clock post.

If the prints are really permanent I think there can be no point to be raised. The process is simple in the extreme.

Two more of mine were done later the same day (Saturday). One took seven tints, the other nine. Judgment as regards the density of the negative and the quality of the light is all that is required for success. The boy never once made a mistake.—I am, yours, &c.,

Harnham Cliff, Salisbury, Thos. Parkyns.
February 27, 1877.

P.S.—I write again on the subject of the Lambertype process because I find (I think) another great advantage over anything else I have discovered as regards printing and *non*mounting for bookbinding purposes. The transfer paper used by Mr. Witcomb is tolerably strong. The glaze (gelatine) can be removed by cold water to any extent desired. The paper can be of any size, and, without any mounting, can be bound up in any book. So it seems to me, though I have not tried it, that there are unknown advantages connected with the system. The reasons why are—1. The unmounted prints do not curl so much as in the silver process.—2. The transfer paper may be of any strength or thickness, or of any quality as regards mechanical composition, so as to attain the highest amount of toughness (I ought to patent this !).—3. There is no reason why any mounting, except for framing as pictures, should be required at all, &c. I saw this at once, and trust it may be of benefit to the fraternity and no injury to Mr. Witcomb, who certainly initiated me in the main points of the system. I could tell you many more ideas that have proposed themselves to me during what I saw in the course of Mr. Witcomb's proceedings, but I should like to think a little more about them. No doubt, as regards carbon printing, so far as beauty, faithfulness to the negative, and easy capability of improvement, where required, is concerned, I must confess I am satisfied with Mr. Witcomb's work. My *beau ideal* of a printer in silver was, and is, Mr. George Avery, of Tunbridge. He has printed for me and for other friends on my recommendation for some time—among others for Mr. Paget, for Mr. Swaine (a nephew of Captain Abney's), and I am now recommending him to take up the Lambertype.—T. P.

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GELATINE *VERSUS* COLLODION.—A CHALLENGE.

To the Editors.

Gentlemen,—I observe that Captain Herbert Kerr, in your last issue, says that he has not heard of any instance in which gelatine plates have been fairly pitted against wet plates, further expressing his conviction, founded upon his own experience, that a gelatine plate is not necessarily superior in rapidity either to a wet plate or to one made with a rapid collodion emulsion according to Colonel Stuart Wortley's formula.

Permit me to make the counter assertion that a gelatine plate can be, and is, made more rapid than any collodion dry plate in the market, and not only so, but more rapid than any wet plate.

As Captain Kerr brings forward such an authority as Mr. R. M. Gordon, whose known skill everyone acknowledges, allow me to quote the same gentleman. I received a letter from him from Portugal informing me that he had tested a gelatine pellicle plate against a wet plate in the same camera, with twin lenses, with a simultaneous, instantaneous exposure. The result was, he goes on to say, "more detail in your pellicle plate than in the wet plate, consequently showing the gelatine dry plate to be more sensitive than the wet." This is not a solitary instance, for I have dozens of letters to the same purport. Still, it does not necessarily follow that a gelatine plate must of necessity be a very rapid one, as they can be made as slow as, or even slower, than a uranium one. If Colonel Wortley believes in the great rapidity of his plates, why does he not use them for quick work himself? Why use wet plates?

Now, I should have much pleasure in settling this matter by having a friendly tilt with Colonel Stuart Wortley or Captain Kerr on the point of rapidity. Let a public trial be made and let plates be deposited three months before exposure, to be exposed simultaneously in one camera with twin lenses. After exposure to be again deposited, before development, for three or six months, or for any longer term determined upon by the editors of the photographic journals, who shall be umpires in this matter, each competitor respectively to develope his own plates, and as he thinks proper. Will Colonel Wortley or Captain Kerr respond to this challenge?—I am, yours, &c., R. Kennett.

8, *Maddox-street, March* 5, 1877.

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Print Burnishing.—Rub over your prints and mounts, before burnishing them, the following solution, which is the best we know or have heard of. It is perfection itself. It keeps out moisture from the prints, and preserves them and gives a brilliant finish, far superior to any soap or soap solution, which absorbs moisture and soon injures the picture. Take as follows:—

White wax	120 grains.
Ether	2 ounces.
Alcohol	16 ,,

Cut or scrape the wax fine, and add it to the ether; shake, and it will soon dissolve; then add the alcohol and shake well again to mix.

When it settles a white sediment will fall to the bottom. Before you apply it to the picture shake up each time. A sponge, or piece of canton flannel with short nap, is best to apply the solution to the picture with. Let them dry before burnishing—not too dry; it will take but a few minutes.—*Practical Photographer.*

EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale*, that being done at a small cost in our advertising pages. This portion of our columns is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

Large lens, five and a-half inches diameter, cost £45, covers eighteen inches, with bellows camera, swing back, fifteen inches square; also, studio stand, to suit, cost £20, together or separate, in exchange for good useful house furniture, or offers.—Address, T. L., 12, Ashburnham-grove, Greenwich, S.E.

For exchange, Anderson's *Skylight and Dark Room* (uncut); Sutton's *Dictionary of Photography;* ten vols. *English Mechanic* (three unbound, all clean and some uncut, published at 7s. each); No. 1 Ross's new symmetrical lens, three inches focus; quarter-plate camera, with dark slide and two carriers; porcelain water-tight bath for 5 × 4 plates, &c. Offers requested. No. 1AA Dallmeyer's wide-angle rectilinear lens, four inches focus; a good hot-plate *carte* rolling press wanted.—Address, W. B., 5, St. George's-square, Stamford.

ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

Notice.—Each correspondent is required to enclose his name and address although not necessarily for publication. Communications may, when thought desirable, appear under a *nom de plume* as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

A. Watkins.—In our next.

R.—Warnerke's pellicle will be more suitable than paper.

A. M. Storey.—Alba, or white enamelled, plates can now be procured from several dealers.

R. C. W.—The journal named is not on sale in this country, but may be ordered through any American bookseller.

T. J. L.—Try the effect of pasting upon the glass some thin white tissue paper. Select an exceedingly thin and transparent sample.

C. F. C.—Zinc may be granulated by first melting it in a common crucible, and, when it has become very hot, pouring it into a tolerably deep vessel of water.

J. B.—Either of the three lenses first named will answer the intended purpose. The alteration will shorten the focus to only a very slight extent. The lens marked D cannot be altered so as to answer.

Edinburgher.—If you would only *try* the effect of substituting achromatic eyepieces for those at present in use in your stereoscope you would never again express any doubt as to their advantage.

B. Anderson.—1. You must have got the wrong salt, for nitrate of baryta is soluble in three parts of hot water or eight parts of cold water. It is not soluble in alcohol.—2. Dilute your negative collodion by adding one-third of its bulk of a mixture of equal parts of ether and alcohol.

Zero.—The markings on your plates are not due to the substratum of albumen, but are caused by the strength of the collodion and silver bath not being so adjusted as to induce that state so fitly designated the "co-operation of the chemicals." Test the silver bath for strength, and try another sample of collodion.

David Scott.—1. Not being aware of the nature of Mr. G. Leach's enlarging process, we are quite unable to offer any opinion concerning it.—2. A paper negative may be produced so as to print quite sharply.—3. Your medical man will be better qualified than we are to offer advice respecting the admixture of oxygen with atmospheric air for the purpose of inhalation.

J. P. Procter.—We are not able to give you "the *best* formula" for making enlargements by a developed process; but we *are* in a position to give you the substitute that Sir William Newton introduced in lieu of the lemon juice made use of by the late Mr. Sutton in his formula for printing by development. It consists of twenty grains of citric acid dissolved in one ounce of camphor water, to which are added twenty grains of loaf sugar and two drops of oil of cloves.

Tpotn (South Shields).—1. The mere act of crystallisation will not purify a salt.—2. Lea's *Manual of Photography* will probably answer your purpose as well as any other, if not better.—3. We have never had an opportunity of testing the quality of chemicals issued by the firm named.—4. We cannot tell you the precise degree of heat, as indicated by a pyrometer, to which your furnace will require to be raised in conducting the experiments connected with the reduction of residues; but in dealing with these high temperatures precision is not required.

W. B. R.—We now quite understand the cause of failure. When the gum was dissolved it was neutral, and in this condition it yielded excellent results; but after standing for two days it became acid, in which state no success whatever could possibly be obtained through its instrumentality. Although the best remedy will be found in always using it when freshly prepared, it may still be worth while to try the effect of adding to it, on the third day after preparation, ammonia in sufficient quantity to render it slightly alkaline to test paper.

Chas. L. Luker.—So very much may be said in favour of both methods of lighting that we are somewhat chary in instituting a comparison between the lime and magnesium lights for enlarging purposes. If it be your intention to produce enlargements at long intervals of time, the magnesium will prove to be the more convenient, because it may be used without any previous preparation; but if you desire to work steadily in this direction, or to produce a number of enlargements at a time, the lime light will be most advantageous. In using the magnesium light we find that, by placing a thin partition at the proper distance from the condenser, having in it a circular hole of about half-an-inch in diameter, the magnesium may be ignited behind this partition without any special care in holding it, as no light whatever can have access to the negative but through the aperture before mentioned, which must be in the axis of the condenser.

J. Gray.—We have received from Mr. Gray an excellent portrait of a child, sharp and distinct throughout, which has been taken by means of the gelatine emulsion to which we directed attention a few weeks ago. Mr. Gray says:—"I have entirely set aside the bath and collodion, as the emulsion is more than twice as rapid as wet collodion; density comes up with a single application of the developer. I have dispensed with the bromide as a restrainer. I simply pour on the alkaline pyro., when the picture comes out at once as quickly as if developed with iron. I have now got it so composed that it flows over the plate as easily as collodion. Large plates can be coated with it much easier than with collodion, on account of its taking a little longer time to set, and the plates dry beautifully without a crack or blister." We are much pleased to find that the gelatine emulsion process has been developed to the extent indicated in Mr. Gray's letter.

Edinburgh Photographic Exhibition.—In reply to Dr. Nicol's letter in our last number, the exhibitor who made the complaint to which that letter had reference says he made no allegation respecting the repacking of his exhibits, this having been well effected. His complaint had reference only to the state of dust and dirt in which he found them, notwithstanding, as he previously averred, his prompt response to an *official request* that he would send one pound as his share of the expense to be incurred in paying a suitable person to explain and show the apparatus; and the payment of this sum, he thought, ought to have ensured at least as much care as was bestowed without charge upon the apparatus at the London and other exhibitions. He has sent us the official letter in question in which the request for a remittance was made. From Mr. W. H. Davies, to whose care the unpacking and repacking of the exhibits were entrusted, we have, just before going to press, received a letter affirming, what everyone emphatically believes, that every care was taken in packing and returning the various exhibits—a fact attested by numerous gentlemen, including Messrs. Warnerke, Ferranti, York, Jennings, and others. It may, perhaps, have been an error of judgment to make exhibitors pay for the services of the gentleman engaged to exhibit and explain the apparatus; but, as the exhibition has proved so very successful in a pecuniary sense, such payments may possibly be refunded. Great credit is due to everyone connected with the management of the exhibition; and from private sources we learn that exceptional skill was displayed in the unpacking and hanging department.

Photographic Society of Great Britain.—At the next meeting of this Society, on Tuesday, March 13, at 5A, Pall Mall East, the evening will be devoted to a discussion on *The Silver Bath.* The subject will be introduced by Mr. John Spiller, F.C.S.

Chomotypes.—From Mr. Higginson, Southport, we have received two charming portraits as specimens of carbon printing. The surface is very fine and yet free from all glaze. Mr. Higgisson is known as one of the most successful carbon printers in this country.

METEOROLOGICAL REPORT,

Observations taken at 406, Strand, by J. H. Steward, Optician.

For the Week ending March 7, 1877.

These Observations are Taken at 8 a.m.

March.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks.
1	30·43	W	—	29	43	25	Foggy
2	30·25	SW	43	43	55	27	Raining
3	30·15	W	47	48	53	42	Raining
5	29·93	N	37	40	47	36	Bright
6	29·92	NE	36	38	44	34	Dull
7	29·44	NW	35	37	40	34	Cloudy

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 880. Vol. XXIV.—MARCH 16, 1877.

THE INFLUENCE OF APERTURE ON THE ACTION OF LENSES.

In speaking of certain influences exercised by the aperture of a lens we must preface our remarks by a definition of the term "brilliancy" as applied to a photograph. Brilliancy implies strong contrasts between the lights, which must be pure, and the shadows, which must be very deep, these contrasts being connected by a perfect series of middle tints. In *hardness* there also exists this strong contrast between the lights and shadows, but the latter quality is characterised by the absence of the intermediate grades. Both brilliancy and hardness are recognised by the strong contrast of light and shadow, one of them having, however, the important quality mentioned above, which is absent in the other.

When a lens—a portrait lens of large diameter, for example—is used without any diaphragm the image on the ground glass appears very brilliant, owing to the great contrast between the deep shadows and the high lights; and this degree of brilliancy cannot be obtained if a small diaphragm be inserted for the purpose of either correcting some fault in the lens or imparting to it a greater degree of penetrative power. If the image be examined, first, with full aperture, and an assistant then drop in, one after the other, a series of stops ranging from the largest to the smallest, it will be found that in proportion as the effective aperture is reduced so does the brilliancy of the image depart. Not only so, but it will also be found that with each further stage in the reduction of the aperture so does the roundness of the image become diminished, until at length a figure which at first was seen standing out in bold relief from the background, and brilliant in its contrasts of light and shade, becomes flat and insipid.

The late Sir David Brewster contended for the use of photographic lenses no larger than the human eye, because, as he stated, lenses of such dimensions would give portraits of individuals as seen by the human eye. But he overlooked the fact that, owing to the binocularity of human vision, images of objects are seen in all that solidity imparted by their being simultaneously viewed from stations between two and three inches apart. If such objects—for instance, a figure seated on a chair—be viewed first by means of both eyes, and then by one eye only, a difference will be appreciated; the former will appear solid and round, the latter wanting in these properties, and having the head quite unrelieved from the background. Similar to this is the effect produced by making use of a lens with a large aperture, taking one photograph by it with an exceedingly small stop and another with full aperture. In the latter the background may be indistinct—quite as much so as it appears to the eyes of a spectator when looking at the figure; but the portrait will be brilliant, vigorous, and solid looking.

The wonderful effect produced by the angular aperture of an objective is well known to microscopists, who recognise the fact that of two such objectives of precisely similar foci, workmanship, and general excellence, the one that is used with the largest aperture reveals in a far more perfect manner than the other the structure of minute objects, and this quite irrespective of the intensity of the illumination of the object undergoing examination.

Telescope object glasses, too, possess this power of discrimination —a power strictly dependent upon their angularity of aperture. In like manner is the production of a photograph influenced in no slight degree by the making use of a lens working with a large aperture on the one hand, and with a small one on the other.

It may be objected that when a lens is used with full aperture, or with a large stop, a great difficulty is sometimes experienced of getting all portions of the figure equally sharp. Equality of sharpness is not necessary, nor at all desirable; but, when any part of a figure is so badly defined as to arrest attention, then recourse should be had to the services of the swing back of the camera in order to equalise everything.

Finally: if a lens be employed having a long focus and small angular aperture (as all such lenses usually have) the contrast of light and shade in the lighting of the figure must be greater than when a lens of short focus and large aperture is employed. The difference in the brilliancy of portraits taken under these different conditions is very great.

"HIGH-TEMPERATURE" PYROXYLINE.

We have been engaged for some little time in a series of experiments to test practically the comparative values of high and low temperature cotton in the washed emulsion process—a subject which formed the theme of an article a fortnight since at page 97. We stated in the course of that article that the qualities most desirable in pyroxyline for the ordinary collodio-bromide process were not the most suitable for the purposes of washed emulsion, and our more recent experiments have proved the correctness of this view in a most remarkable manner. It is not necessary here to recapitulate what has already been said as to the why and wherefore of this difference—sufficient that the distinction exists. It is our intention in the present article to confine ourselves to the practical side of the question, and to detail the results actually obtained with different varieties of pyroxyline.

Before commencing, however, we must say a word or two on the subject of the so-called "high-temperature" cotton. We may ask—What constitutes a high temperature as applied to the acids used in the preparation of gun cotton? The answers may probably be very various, extending over perhaps fifteen or twenty degrees. Now, while it cannot be denied that temperature forms a very important item in the conditions attending the manufacture of pyroxyline, a variation of a very few degrees producing a clearly distinguishable difference in the result, it is difficult to explain why, in the face of so wide a margin of temperature as that mentioned above, the effect secured should be attributed to the fact of the cotton having been made at a *high temperature*. We call attention to this merely to point out that the term we have italicised is, if not a misnomer, a meaningless designation; for it is easy to produce vastly different results under exactly similar conditions in this respect. The quality or collective qualities of any given sample of pyroxyline are due, not to one single condition, but to the joint effect of three or four.

In addition to the temperature of the acids employed we have to take into consideration their strength, as well as the proportion in which they are mixed and also the character of the cotton operated upon, and each of these conditions has its share in modifying the properties of the resulting pyroxyline. The last-named condition is one which is frequently overlooked; but in practice it will be found that some descriptions of cotton may be successfully treated with a mixture of acids which would entirely dissolve other samples. The superior quality of the pyroxyline made from the higher grades of cotton (as Sea Islands) is to be attributed to their power of resisting the disintegrating action of the acids, rather than directly, as is usually the case, to the possession of a better staple; for any advantage which might accrue from the latter source must necessarily disappear upon solution of the product in ether and alcohol.

We judged it impossible to secure any trustworthy comparisons when using commercial samples of pyroxyline, owing to the absence of the necessary information as to the method of preparation. We therefore decided to conduct our experiments with samples of our own manufacture, with the properties and peculiarities of which we were fully acquainted. With this object in view we prepared two different lots, varying the formulæ so as to produce distinct characteristics in the resulting pyroxyline. Formula No. 1 gave a product suitable for use in the ordinary wet process, or it might be utilised, with certain precautions, for enamelling and transfer purposes; but when applied to ordinary emulsion work it proved entirely unsuited, being deficient in sensitiveness, and giving a thin, blue image which it was impossible to intensify. By allowing the collodion to "age" it is not improbable that the result might have been different. The product of formula No. 2 was more closely assimilated in general character to the article supplied commercially, and now universally employed for emulsion purposes. It was short and powdery in texture, and gave when dissolved a smooth, structureless film. Density was easily obtained with alkaline pyro. alone, even if the collodion was sensitised when quite new; it was in fact what is now known as "high-temperature" cotton. The following are the formulæ:—

No. 1.

Nitric acid (s.g. 1·40)	4 ounces.
Sulphuric („ 1·80)	8 „
Water	1½ ounce.
Cotton	180 grains.

The temperature 150° Fah., and the time of immersion fifteen minutes.

No. 2.

Nitric acid	4 ounces.
Sulphuric acid	6 „
Water	1 ounce.
Cotton	150 grains.

Temperature 162°, and time of immersion ten minutes.

The cotton employed in both cases was a good sample of Sea Islands. This description of cotton, which is eminently adapted to the purposes of the photographer, is very long in staple, and fine, almost silky, in texture. It is frequently much contaminated with particles of the seed husks, which, however, beyond the appearance, do not seem to affect the result, and are removed from the collodion by filtration. We do not resort to any artificial means of cleaning the film previous to its immersion in the acids, but use it in its raw state as imported. Any chemical treatment, as boiling with alkali, seems to destroy a portion of the good quality, besides entailing considerable trouble in washing and drying.

The weight of the product of No. 1 formula was as nearly as possible 210 grains, but the gain in No. 2 scarcely amounted to ten grains. No. 1 was clear and strong in fibre, No. 2 short, dusty, and harsh. The respective collodions gave films in the one case strong and tolerably tenacious, and in the other porous and comparatively "short" and rotten. No. 1 formed a collodion which might be classed as a fair sample for wet-plate purposes, but with a tendency to toughness or horniness, while the other represents the formula we were in the habit of using for ordinary emulsion work.

The proportions of bromide and silver employed in forming the emulsion vary so greatly in the hands of different workers that we found it impossible to do more than note the difference in behaviour of the two pyroxylines in the presence of excess of soluble bromide and silver respectively, without extending the inquiry to the more minute details. With this object we prepared our samples of collodion, two from each batch of pyroxyline, using eight grains of cotton and fifteen of dried cadmium bromide to each ounce of solvents. These collodions were sensitised in pairs, one from each sample of cotton; one pair was sensitised with sixteen and a-half, the other with eighteen, grains of silver nitrate to each ounce.

A difficulty presented itself in the selection of the restraining acid to be employed with the excess of silver. This addition was, of course, necessary to the successful working of the emulsion, and the question arose as to which acid was least likely to interfere with the truth of the results. Sulphuric acid was considered inadmissible owing to its powerful action in modifying the character of the collodion. Hydrochloric appeared equally objectionable, as, even supposing its power to combine with a portion of the silver to have been allowed for in calculating the necessary quantity of silver, the presence of silver chloride would only introduce one more complication, which might throw considerable doubt upon the deductions finally arrived at. For these reasons we fell back upon nitric acid as exercising no special action which would be likely to affect one emulsion more than the other; it was used in the proportion of one drop to each ounce of collodion. We thus had two emulsions from each sample of collodion—one containing free bromide, the other excess of silver. These were poured out, washed, and converted into pellicle in the ordinary manner, and without any attempt at organifying, each emulsion being left entirely to itself in the production both of sensitiveness and density.

The first experiment we made was a comparison between the No. 2 cotton and a commercial sample obtained from one of the best London makers, and which is much used for washed emulsion, our object being to establish a sort of relation between them, in order to strengthen the comparison between the two samples of our own manufacture. The result showed that our own sample was slightly inferior, though the behaviour of the two was similar in character, as also their physical properties; the difference was such as might be attributed to the one being more "powdery" than the other, and did not seem to be altered whether silver or soluble bromide were in excess. Having been thus satisfied that the No. 2 sample of cotton prepared by ourselves formed a tolerably close approximation to that usually employed for emulsion work, we proceeded to test it against the other description made at a lower temperature under other conditions favourable to a less powdery result.

The difference in behaviour was really remarkable. This might, indeed, have been expected; but we had not been prepared for so complete a corroboration of the views we expressed in our article of a fortnight ago. The trial plates were exposed in pairs for equal lengths of time; the image formed by the more organic emulsion, with free bromide, developed rapidly, and acquired the necessary density without difficulty under the alkaline developer alone, and, in fact, gave results with which no special fault could be found. The plates prepared from the other sample of pyroxyline developed less quickly, and appeared to resist for a considerable time the intensifying action of the developer, but gradually reached printing density. An examination of the two images side by side, however, was necessary to demonstrate the full extent of difference; for, while the more organic image by itself appeared clear and brilliant, when viewed in juxtaposition with the other it became dull, coarse, and foggy in comparison. The superiority of the image given by the No. 1 sample of cotton, in point of brilliancy and clearness, was not due to under-exposure or hardness, as it possessed, perhaps, more detail—certainly finer gradations—than the other; it seemed rather attributable to the presence of some element of a restraining character. The two effects were similar to what might be produced in the wet process by using a perfectly new collodion against one that had been allowed to age a little.

The most important feature, however, remains to be described. We have related that the development of the less organic emulsion was slower than the other. It must not be imagined from this that a longer exposure is rendered necessary; for the fact is that, though slower, the action of the solution may be continued for a much longer time than is possible in the other case, and with a given exposure much more detail may be obtained with the low-temperature cotton—indeed detail will continue to appear in the latter films long after the more rapidly-developed ones have become hopelessly fogged. The peculiarity of the tougher cotton appears to be the difficulty of fogging it.

Turning to the emulsions made with excess of silver the difference was even greater; for, with all deference to the supporters of free silver be it said, it is almost impossible to secure really first-rate results with a washed emulsion made from organic cotton in the presence of an excess of silver. The characteristics of the two images were similar to the last described, only more widely removed, and the general impression left on our minds by the experiments is that high-temperature cotton for the purpose we have in view is decidedly a mistake. We have already run this article to such a length that we must hold over the continuation until next week.

MODERN PRINTING.—ACID IN THE PRINTING BATH.

We have been surprised, on looking through and comparing with each other a number of photographic manuals, old and new, to observe with what persistence and frequency old, useless notions and old fallacies, evidently in the majority of cases copied and handed down from a single original, are preserved without alteration or comment.

In some cases they are the remnants of old practices now fallen into disuse, and in others pure figments with no foundation of any kind but individual caprice. In the former class stands the recommendation to add acid to the silver bath for floating albumenised paper upon. If, however, we cast a retrospective glance over a considerable number of years we shall find a very sufficient reason for the recommendation in the fact that an acid print was able to decompose the hypo. fixing solution, and so result in a decided gain in appearance; for it will be remembered that the most brilliant prints, with rich, transparent shadows, were produced by these means, and which surpassed all the efforts at the time of its first introduction of the "alkaline gold toning." In those days acid was even added to the fixing (or rather toning and fixing) solution itself—a practice the bare mention of which would cause a well-trained photographer of the present day to shudder. But those were the times whence we date the origin of so much of the stigma of fading still popularly attached to photography of all sorts. Now the whole system is changed. Prints toned by the alkaline process, when well and efficiently done, possess, owing to the skill begot of experience, all the richness and velvety tones of the "sulphur-toned" pictures, with an added purity and pearliness in the whites to which the former never could attain.

Yet, do we find any difference in the treatment of the paper in sensitising indicated in the text-books? Not at all; nor are we inclined to think that in practice the majority of printers either make, or are fully aware of the need for, a change. It has, however, strange to say, been the custom of certain albumenisers, in the instructions they issue to their customers accompanying their parcels of paper, to give the very instructions which we refer to as not hitherto having found a place in the text-books; for this reason we now call especial attention to the advantages of the newer system.

With an acid bath the paper prints to a red colour, very pronounced in tone, and beautifully rich and velvety; upon close examination, however, the blacks—that is, the darkest portion of the print—will be seen to be of a peculiar tone, which can best be described as appearing like a *thin* wash of deep colour upon white paper. It appears to possess no body or depth, although, at the same time, it possesses the rich colour we speak of, but which is not to be confounded with the rich, warm tone always taken by that part of the sheet which has been lowermost in drying after albumenising, with a consequent thickening of the coating.

So far for the appearance of the prints. When they come to be toned they behave at once in a manner that arouses suspicion. They soon begin to lose their richness of appearance without any corresponding gain. They become flat and insipid-looking; they cannot be got to the blue stage by any means; and no range of colour between red and blue can be satisfactorily obtained. This, we apprehend, is one, and an important, cause of the partiality for very warm-toned prints shown by some operators.

Now, let the bath be a neutral one, and what is the result? An entire change. The tone in the printing-frame is quite another thing; it is colder and, perhaps, less brilliantly rich, but it looks deep and solid, and the blacks are characterised by an appearance of fulness and body. In toning the difference is equally seen; it goes on evenly and quickly. At no step of the process does the action halt till, if allowed to remain in the solution, the picture arrives at either a milky-blue or milky-warm purple, according to the paper employed. We are of course assuming all through that the paper is not fumed, the appearances then presented being so different.

Most books, as we have stated, recommend the addition of acid. The best modern practice indicates the starting with a neutral bath, and the preserving its neutrality. This is by no means the simple matter that might be imagined, every sheet of paper which is floated tending to cause the bath to assume the acid state, a score of whole sheets of paper being sufficient to render half a gallon of bath quite acid and almost useless for the best work, where the toning is required to be carried far; hence a remedy must be found, and there is one very simple and easy of application. All that is necessary is merely to add a small quantity of carbonate of soda—not the so-called "bicarbonate" or "sesquicarbonate" of the shops, but the crystallised monocarbonate, or "purified washing soda," as it might be termed. A few grains of this added to the bath at any time will make it neutral, and, if it be added periodically, and the precipitate which an excess causes be left on the filter, and which need not be changed till it break, the bath will always be in good working order.

This method is infinitely to be preferred to the old messy kaolin treatment. One cause, we shrewdly suspect, of the once-prevailing fancy for the use of this material lay, probably, in its not being entirely innocent of contact with sophistication, in the shape of chalk or whiting, which, as carbonate of lime, would have the effect of neutralising any acidity produced in the daily use of the bath.

We may finally note that if these recommendations are followed no fear need be entertained, we fully believe, of the bath becoming discoloured; indeed, we must candidly state that we do not remember for some years having had a discoloured bath except by accident or oversight.

Once more that fertile source of trouble, the negative nitrate bath, has been introduced for discussion at the Photographic Society of Great Britain. A prolonged conversation on the subject took place on Tuesday evening, the result being that the matter now remains in very much the same position in which it has been for several years. In saying this we must make two exceptions:—First, the imagined advantages claimed on behalf of an addition of nitrate of uranium to the silver bath now appear to be no advantages at all, but rather positive disadvantages; and, secondly, the crystalline deposits so long believed to consist of iodo-nitrate of silver, and to the presence of which pinholes were due, are now considered to be sulphate of silver. Owing to the incomplete *data* placed at the disposal of Mr. J. Spiller, and upon which he has based this belief, it would be premature as yet to assert our acceptance of this theory. On the other hand, the idea broached by Mr. Warnerke, two or three years ago, of a fulminate of silver being formed as a decomposition product in the bath after long use was not favourably received by Mr. Spiller, on the grounds of no detonation having been observed when subjecting these crystals to heat or percussion. At the same time, it was argued by that gentleman, the fact of detonations taking place would not thoroughly establish the formation of fulminating silver, because it might have been caused by the presence of a glycerine compound. In none of the compounds handed to Mr. Spiller for examination had oxalic acid been found, although it had been carefully looked for; but sulphate of silver had been discovered in large quantities. It was worthy of notice that when a nitrate bath had been contaminated with this salt the mere reduction and fusion of the metal would not eliminate it. To do so the silver would have to be fused with nitre, otherwise the impurity would be found in the nitrate made from such silver. Cyanide of potassium and nitrate of barium—so long believed to be quack nostrums—are now found to be useful and advantageous additions to the bath, especially when it ceases to work properly. But we shall have more to say on the whole subject in our next.

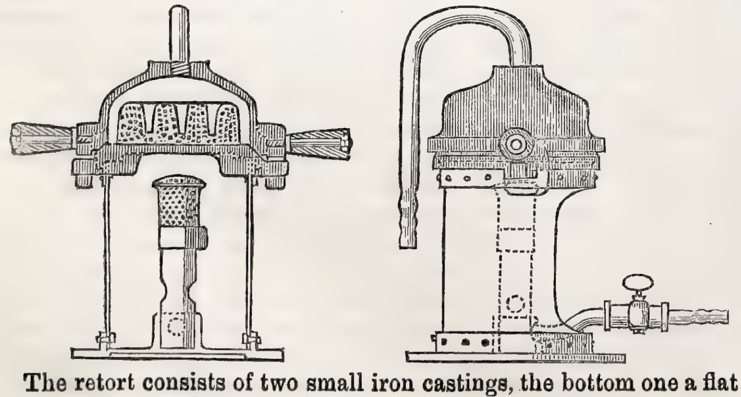
We have so frequently expressed our opinion of carbon printing as to render it unnecessary here to add anything in support of the observations contained in the first portion of Sir Thomas Parkyns' letter in our last issue; but the suggestion made in the postscript with regard to dispensing with the operation of mounting the prints is worthy of more than passing consideration. The trouble involved in the mounting of an individual print is, perhaps, a matter of very little importance; but when a number have to be operated upon, especially if the size be large, the saving of time and trouble which accrues if the mounting be done away with becomes of sufficient importance to engage our attention. With silver prints this end is unfortunately not easily attained, for the reason that the support upon which the picture is produced must undergo all the operations necessary for the formation of the image, and remain at the finish pure and unsullied—an ordeal which no cardboard and scarcely any thick papers are capable of successfully passing through. In the carbon process by double transfer, however, the case is entirely different; for the image is formed and developed upon a temporary support, and is ready, when the development is completed, to be transferred to its final resting-place, which may be chosen from a variety of materials. There is no valid reason that we can discover why the pictures should not be transferred direct to a suitable card instead of upon paper—at least for small sizes; indeed, we have in our possession some specimens of *carte*-sized portraits which have been so manipulated. With larger sizes, or when a considerable amount of margin is required upon the mount, difficulties of a mechanical nature would be experienced, which might, however, be eventually overcome. The glazed surface of the prints developed upon glass would certainly form an objection in the case of pictures of any size, and even with *cartes* it is looked upon by many with disfavour; but we imagine that by employing the Autotype Company's flexible support in place of collodionised glass this might be obviated. By using a suitable cardboard, no doubt, the curling or "cockling" of the finished print would be reduced to a minimum; at least the method is worth trying, and if feasible we are certainly indebted to Sir Thomas Parkyns for the suggestion.

A NEW OXYGEN RETORT.

[A communication to the Manchester Photographic Society.]

In bringing before your notice a new oxygen retort I do not claim the credit of any great invention, but simply an improvement in one or two respects upon what we have previously seen.

My improvement consists—Firstly, in making the oxygen mixture in the form of cakes instead of plugs or cylinders, which latter method was first introduced by our friend Mr. M. Noton. Secondly, in the shape of the retort, which is made so that the cake lies upon the bottom, and is only in contact on that side. Thirdly, in making the bottom portion of the cake, which bears upon the retort, to consist simply of manganese, sand, or other substance (containing no chlorate of potash), upon the top of which is placed the oxygen mixture, still forming one compact cake. Fourthly, in the perforating of the cakes.



The retort consists of two small iron castings, the bottom one a flat circular plate with two projecting lugs. The upper portion, which is bell-shaped, is made a little larger inside than the cakes to be used, and is attached to the bottom portion by means of a bayonet joint, although other fastenings may be adopted. The gas-tight joint between the two portions is easily made by grinding the two surfaces together, after having turned them to something like the shape. The stand simply supports the retort over an ordinary Bunsen burner, and may be attached to the top of the gas-holder, hung upon the side, placed upon a convenient table, or even on the floor.

From the bent tube on the top portion of the retort an india-rubber or flexible pipe conveys the gas direct to the gas-holder. A small wash bottle, as shown us three meetings ago by Mr. Noton for preventing the return of the gas and back pressure, may be used, or an ordinary back pressure valve or a common tap.

The object of using cakes of the above description is that they leave the retort perfectly clean; for, as it is the chlorate of potash that fuses and sticks to the retort, the manganese or sand which forms the bottom of the cake, and is the only portion in direct contact with the retort, is a sure means of preventing any sticking. This plan I also adopt in the case of plugs or cylinders. The perforation of the cakes is simply to facilitate the generation of the gas.

This apparatus is made to contain a cake of three inches diameter and one inch thick, which will produce about 1·75 cubic feet of oxygen.

There are other advantages to be derived from the use of this apparatus. As this is more of a social meeting than a scientific one I will not detain you longer, but to anyone interested I shall be glad to show the apparatus at work later on in the evening.

William J. Chadwick.

PHOTOGRAPHY FROM A HOLIDAY-MAKER'S POINT OF VIEW.*

And now some may ask—Of what use is it to go to so much expense and trouble, when for a few shillings or francs you might have purchased as many pictures as you ever bring home with you? The answer to this is very obvious. The pictures you yourself take are secured from your own particular point of view, and show you the scenes as you yourself, and not other people, have seen them. I could no doubt purchase a view of the Gloss Glockner for eighteenpence, but the chances are I should not recognise the mountain and its glaciers at all if I did not exactly know the spot whence it was taken. I prefer a hundred times my own little brown and white images, each of which carries a distinct reminiscence with it, and has a story of its own. Besides, my negatives will give me enlargements to any size, such as I show tonight, printed in permanent pigments; or I can produce lantern transparencies in carbon, of which I should have been delighted to have exhibited a series this evening if the apparatus for doing so had not been so cumbersome.

When enjoying yourself on a summer's day in some rustic paradise, it is something to know that you can take back with you a reminiscence that will serve to call up the pleasures of your journey once more; to know that you can bring home a capfull of the bright sunshine with you, stored up in that film you are exposing; to be assured that you have not seen the last of that glittering landscape at your feet, or of that splashing waterfall among the trees, or that quaint, old-fashioned village through which you have just passed.

People are apt to make comparisons between scenery at home and that abroad, and that there is a marked difference between the green, leafy charms of our own island and the grand views of lake and mountain on the continent no one will deny. Indeed you have but to glance at those Yorkshire and Cumberland views of mine to mark the contrast between them and those of the Tyrol and Italian lakes. I point this out because there are many who vow that the beauties of Great Britain are altogether unrivalled, and these people as a rule never tire of uttering the well-worn advice to "see your own country first" before you venture abroad. It is doubtless excellent counsel, but nevertheless one should be cautious in listening to it; for it comes, maybe, from those who are as ignorant of the pretty nooks and corners in our own kingdom as of the famous scenes on the continent they are envious of your visiting. Far be it from me to depreciate the rustic beauties of Great Britain. There are no such woody glens, such fresh, green pastures, such stately parks, such white cliffs, such purple moorland, such cool, shady lanes as in this sweet country of ours; none in which a pleasanter holiday can be spent. But because one has a liking for home-grown strawberries and the clotted cream of Devonshire, it is surely no reason why you should feast on nothing else, and eschew altogether such good things as the black figs of Italy and the luscious peaches of France. And it is as idle, to my thinking, to contrast the flavour of these different fruits as to make comparison between Clovelly village and the Rhone glacier, or the leafy banks of Loch Katrine and the blue Bay of Naples. *Suum cuique* I would say, and there let the matter rest as regards the scenery of rival countries. But as to the advice of waiting to see your own country before setting foot on the continent, there are many points to be considered. Some of us have not always the time and opportunity, or that urgent desideratum, a balance at our bankers, and under these circumstances it is wisest, I think, to go when one can. Besides, seeing one's own country may mean much or little according to whether he who tenders to advise has himself travelled far and near. A traveller may be well acquainted with every great city in the kingdom, and yet have seen nothing of the beauties of Great Britain and Ireland. Short holidays, however, are usually more frequent than long ones, and it is only in the latter case that a trip abroad can be undertaken. One more argument may be advanced against confining your early travels at home: unless you journey abroad when young you can never appreciate fully the pleasure of foreign travel; for, not only are you apt to become prejudiced as years increase, but you desire more than ever comfort and luxuries, to be without which means simply to be miserable.

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* Concluded from page 103.

I have said that one charm about photographs taken upon a pleasure journey in this way is that each of them has its own story. I only wish I could tell you some of them, but my paper has already gone beyond the limits I first intended. I will, however, cite two cases. There is a little picture in one of my Tyrol series; it shows a line of travellers steadily pursuing their journey through a waste of snow. The last is a ghostlike individual and represents myself, for I had to uncap the lens before taking up my post, and the bright reflection from the snow began to act upon the sensitive film before I could assume my position. That little picture was taken at our resting-place, and calls to mind a jolly picnic upon the snow fields just above the Pasterzen glacier that flows round the foot of the Gloss Glockner, here a gigantic sugar-loaf of pure ice and snow. As we rested we could see the whole broad sweep of this glacier, at first dazzling in its whiteness, and then breaking up, as it descended, into huge crystalline masses of translucent emerald. The glacier encircled the rocks at one's feet like frozen billows, and you felt tempted to descend, as it were, to the beach and toy with the glacial water.

A story connected with two pictures in my English series and I have done. One of these represents a low stone building, and the other a dirty court-yard with a stable and a pump in the foreground. They are photographs of Dotheboys Hall. I was in Yorkshire, footing it over the moors, through beautiful Wensleydale, ascending Hillbrough, and visiting such out-of-the-way places as High Cup Nick, Cauldron Snout, and Conky Scar; and I may here remark that anyone who believes it is necessary to go abroad to get away from town and everyday life should cross from the "High Force Inn," in Teesdale, to Hawes and Ulleswater, and he will find a two days' march before him through a district as primitive and secluded as the greatest hermit would desire. During twenty miles of the way he will scarcely see a habitation or meet a living soul as he traverses the waste of moorland and savage defiles by which his way passes. From Teesdale I came down to Greta Bridge, Yorkshire, possessed with an ardent desire to obtain a photograph of Dotheboys Hall. To the village of Bowes is a five-mile walk. Squeers and Nicholas, it will be remembered, drove over in a pony chaise, and then the problem was to find out the spot. The good people of Yorkshire are a frank, open-hearted race, but I somehow had misgivings about the inhabitants of Bowes possessing any love for Dickens after his exposure of cheap boarding schools, and I proved quite right in my surmise. However, by far the greater portion of the villagers have never so much as heard of Dickens, and a deep-set scheme on my part to have a pipe and glass one evening in one of the ale-houses, and so get into conversation with the cronies of the place, was altogether unfruitful. The old landlady of the inn was, however, better informed, and after expatiating on the interesting character of the town, the Roman Encampment, the Norman Castle, the grave of the lovers Edwin and Emma, whose story has been sung by the poet, I cautiously approached "Dotheboys." I at once touched an unpleasant subject, and my kindly hostess waxed so wrath about "young Mr. Dickens" that it was only by introducing the Romans again and interesting myself in a big five-foot wall in the kitchen, which was supposed to date from that period, and which I tapped and examined with the assiduity of an antiquary, that I found myself in smooth water again. I had found out two things, however—the locality of the building and the fact that the village people looked with no favourable eyes upon admirers of the great novelist. A search the same night in the dark brought me to my destination, and the next morning I made a further reconnaissance. A long, low, stone building, just outside the village, was the spot, and from the Norman Castle, where I took my camera, a good, if distant, view of the front was obtainable without observation. To take the rear of the building it was necessary to be cautious. I fixed on the place for setting down my camera—on a low stone wall—and estimated roughly how much of the building I could get into my picture. I counted the paces to judge distance, and then focussed an object at a similar interval. My plate was put into the camera, the slide drawn, and, accompanied by a friend, we moved toward the building and set down the apparatus, turning away from it at the same moment and becoming much interested in a dog-cart standing in the road. Securing this picture made me bolder. I passed the side door and looked in. It led into a yard showing the back offices, the well or pump that used to become frozen in winter time and make it necessary, occasionally, to substitute a "dry polish" for washing on the part of the boys. There, too, was the stable where Smike would rub down the shaggy pony, If I could only get a picture of this I should be happy. Some children came out on seeing my companion and myself, and called out "There's nobody in; there's nobody in." This decided me. I calculated roughly the distance as before, slipped in a plate, and while my comrade conversed with the children in a moral strain I placed my camera on a convenient step. Exposure began, and I had just given twenty seconds when my friend, who had never ceased speaking to the children, whispered in French "*Gardetoi.*" I capped at once and saw behind me a woman approaching up the yard with a big stick. I swept camera, plate, and slide under my arm and made a clean bolt of it; but the object of the good Yorkshire woman's indignation was not myself, but an unruly cow that had escaped into the road. H. Baden Pritchard, F.C.S.

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HOW TO USE A FLAP SHUTTER.

The time is fast approaching when the votary of the camera and the lover of nature will issue forth with all the zeal, freshness, and joy which the early spring ever brings with it. Cameras will be taken out and dusted, dark slides looked to, and lenses wiped. Those who made favourable progress last season may probably be thinking of investing in new apparatus of larger size or of better construction. My present object is not to deal with either camera or lens, but with the flap shutter, or sky shade, now attached to numerous lenses, and indicate how best to use it with advantage.

The question has often been put to me—"How is it we never can get the objects at the ends of the plates out as strong as in the middle?" The reason is obvious enough to those who look on the picture formed on the focussing-screen of the camera. They will there find, unless a lens be employed which will cover a much larger plate than the one they are using, the light falls off considerably at the ends of the plate. This is caused by the oblique rays having a greater distance to travel before they reach the plate, the consequence being that the plate requires a longer exposure at the ends than at the centre. Here we overcome the difficulty by a judicious use of the flap shutter.

In making the exposure with the shutter do not throw the shutter up quickly, but determine beforehand the time you intend the exposure should occupy. If a short exposure be all that is required then raise the shutter quickly up to the full extent, and then as quickly lower it again, letting the raising and falling of the shutter occupy the whole time of the exposure without stop or rest at any part of the operation. If a longer time than ten seconds be required for the exposure, then divide the time into two or three, and give, as it were, two or three different exposures; by so doing it will be found that the foreground, the distance, and the sky are all properly balanced one to the other. This, however, does not affect the dark ends of the plate; these we have yet to balance up to the middle and better-lighted position, and this is where we gain a great power in the use of the flap shutter.

After having given the several exposures as above, then turn the shutter from the horizontal position to a nearly vertical one. Now open the shutter just sufficiently wide to light up the end. This must be done as described for the general exposure—that is, opened and shut without resting at any particular point. By thus using the shutter the foreground, the sky, and the ends become one harmonous whole.

In conclusion: I do not wish it to be understood that I claim any originality for the use of the shutter, but simply to point to a mode of getting the ends of the plate equally exposed with the centre, and this more especially when we have trees or other dark objects at the end of the plate; for then we are at a double disadvantage, inasmuch as the lens does not work so quickly at the sides as at the centre, and the trees in themselves require double or treble the exposure of the other parts of the picture. R. Kennett.

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SCIENTIFIC JOTTINGS.

The securing of the stoppers of volatile liquids, such as ether, alcohol, &c., more especially when they are required for exportation to hot climates, is a matter of some difficulty, the best plan being to make a thin, soft "luting," and to apply it with finger and thumb round the stoppered bottle, tying all up with a piece of bladder. A list of lutings for ether, bisulphide of carbon, &c., has been prepared by Mr. B. S. Proctor, and we here append them:—

No. 1.		No. 2.		No. 3.		No. 4.	
Clay	30	Clay	30	Clay	5	Felt	
Water	3	Gum tragacanth	1	Gelatine	2	Gelatine	2
Glycerine	8	Water	3	Water	2	Water	2
		Glycerine	8	Glycerine	6	Glycerine	6

When a clay luting is required to be rendered impervious for a long period the addition of glycerine assists. No. 1 has sufficient to preserve it from falling into either extreme of dryness or moistness. No. 2 gives more flexibility—useful in cases of tube connections. No. 3 more flexibility, but requiring to be applied warm. The last (No. 4) form is intended to be applied to felt, for instance, to form washers, or to corks and bungs, which, when saturated with the mixture, seem quite impervious to the vapour of ether; they, however, should be boiled in the mixture, and then drained before using.

The subject of tempering of glass, so much before the public a few months ago, and from which so much was expected to benefit photography, is little heard of now, and the annealed objects are almost as difficult to come across in everyday life. In *Les Mondes* some time back particulars were given of the baths for the tempering process. If water be used a breakage is almost always the result; fatty matters perfectly purified, and virgin oil free from all admixture, give good results, the temperature employed varying from 150° to 200°. Glycerine could not be used for the purpose.

A very useful paper, by H. Napier Draper, was read before the Pharmaceutical Society of Ireland, on Feb. 8, and contained some facts in relation to ether not generally known. The chief purport of the paper was to show the solubility of sulphuric ether in hydrochloric acid, which menstruum takes up a surprisingly-large proportion, the ether being anyhdrous, the acid of full strength—·725 + 1·196 s.g. respectively; equal parts of each will mix perfectly with a considerable rise in temperature. We briefly epitomise his statements, which possess a photographic interest.

In saturated solution of calcium chloride ether is quite insoluble.

Distilled water at 11° C. dissolves ten per cent. of ether by volume, this solubility being in accordance with the text-books, which usually also state the converse to hold, *i.e.*, that ether will dissolve ten per cent. of its own volume of water. Mr. Draper, however, gives, as a mean of five experiments he made, that ether will only dissolve at 12° C. two per cent. by volume of water. He puts this discrepancy down to experimentalists having used ether which was not free from alcohol. The ether he employed was of the specific gravity given above as 14° C., but he did not pledge himself to its exactitude, owing to the volatile and expansive nature of the fluid. He incidentally mentions the best test for the purity and dryness of ether. Shaken with finely-divided acetate of rosaniline (one of the set of magenta salts) the latter communicated no colour to it, from which he concluded that no alcohol was present. Bibulous paper immersed in a saturated alcoholic solution of chloride of cobalt, and then dried, remained blue after twenty-four hours' contact with the ether, satisfactorily showing the absence of water. These stringent tests are such as very few commercial ethers will stand.

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OUR OUTDOOR MEETINGS.

[A communication to the Edinburgh Photographic Society.]

It is with some diffidence that I appear before you with a paper, seeing that I am, comparatively speaking, but a young member of the Society, and also that my knowledge of photography is of such a very limited nature that I have attained to little more than being able to prepare a decent plate and develope out of it a pretty fair negative. And, believe me, I am not a bit conceited in having got so far, for the longer I prosecute the (to me) pleasurable pastime the more I find I have to learn, and the oftener I mix with the working members of our Society the further I get advanced in the art. This is the principal reason I have for doing my little to advocate outdoor meetings, for at them many useful hints are obtained and much experience gained. Another reason I have for bringing these meetings before your notice is the fact that there are many who have joined the Society within a few months who do not know of the existence of such an auxiliary, and there are also those who have been connected with it for years who seem at least either not to know or to have forgotten that these meetings have been an institution for long. It is by way of information to the former, of remembrance to the latter, and for the purpose of having them more largely taken advantage of, that I endeavour to bring their claims before you.

Our outdoor meetings were, I understand, instituted some years ago for the purpose of making up, in some measure, for the recess of our ordinary meetings during the summer months, it being often found that an accumulation of business waiting for the resumption of the usual meetings was the result; but by the institution of outdoor meetings any pressing business could be disposed of. Now this, I believe, was one of the objects to be gained, but never in all my experience has it been the principal one. I have never "sat in council" at any that I have attended. I have seen numerous cameras employed, and heard a great deal of conversation about the Society and the weal thereof, but little more in the way of business.

These meetings are composed of members who, for the occasion, are willing to leave the conducting of their business to other heads and hands, and enjoy a day in the country. A day having been fixed on, and the spot to be visited selected, a general preparation takes place; those who have not a stock of plates on hand rectify this state of matters, and others get their traps collected together. Everything is carefully gone over to see that all the apparatus is in its place and all working smoothly; for it is a bad job if you omit to put your lens in your pocket, forget your tripod head, or find that that fractious shutter is going to bother you again while you are far removed from where a sprinkling of blacklead or other suitable substance can be got to sweeten its ups and downs. This brings to my recollection what frequently happened to a friend of mine who eschewed collar studs. On a Sunday morning (when a long rest was excusable) it was no unfrequent thing to hear him exclaim, when his collar button and collar button-holes did not work sweetly—"It all depends on a button whether or not I am to get to church this morning!" Just so is it with photography in the field. On that fractious shutter or the forgetting of that very particular screw will depend whether or not I am to get some of those charming views, or, at all events, get them in comfort.

I speak from experience as to the preparation I used to have in my early days; but I am happy to say that, as to forgetting any requisite, I speak only from surmise. The plan which I have adopted for some time, and the motto which suits it, is "ready, ay ready." I have everything at all times ready; that is to say, my slides are always full, camera, &c. packed up—everything just to lift and go; and this plan I would recommend to all who are in the habit of leaving everything to the last, for it is strange if, in the hurry of the moment, something is not forgotten.

Well, then, after a pleasant drive, train, or sail, we arrive at the scene of operations, or, at least, the locality in which our work is to lie. Here we may have the rushing torrent or the peaceful, flowing stream or river, the hill and dale, the stately trees or venerable ruins, which, while furnishing us with subjects for our cameras, give us also subjects for contemplation, and lead our minds "far back to other years." If the immediate locality abounds in subjects a tour of inspection takes place, and the time fixed when this and the other view will be suitably illuminated. If, on the other hand, they are so situated that this mode of procedure is rendered impracticable, then matters are just to be taken as we find them, and the best selection possible made. Cameras are then unpacked, set up, and focussed, light and watch (about the best of all actinometers) consulted, and, under favourable circumstances, in from three to five minutes we expect to have a fine picture.

Now, during our journey the conversation has been almost entirely on photography. It has brought us out, and it is the topic and object of the day. Are we bowling along some beautiful highway we see a picture in that quaint gateway, from which there recedes an avenue of noble trees; in that lovely rose-clad cottage, with its latticed windows and rustic porch. Is our home for the time on the deep, then the rolling billows as they break on some rock-bound coast arrest our eye; or are we careering through a beautiful tract of country, getting only a momentary glance at the beauties we pass, almost instinctively we see down in that glen, with its streamlet and wooded banks, or in that silvery and placid lake, with the bold and rugged mountain side mirrored on its bosom, something worthy of our admiration. So identified does everything appear to be with our pursuits that we find pictures in trees, beauties in running brooks, subjects in stones, and photography in everything. And then the experiences of one another are freely given; this and the other method of working is recommended, and new processes are sifted; anything striking in apparatus is overhauled; and a chorus of voices extol its merits. "It's a capital idea," says one. "The description given leads me to think that it will be a felt want supplied," says another; but one canny Scot "thinks that it looks all very well in print, but the proof of the puddin' is the preeing o't." Photographic literature, generally, is considered, and this and the other doctrine therein taught reviewed; thus the conversation proceeds, and thereby much valuable information is got. And during our picture-seeking how our minds and tastes get educated! Bear in mind I am speaking as a young aspirant in the art, with lynx eyes watching every motion of the veterans who, as a rule, figure among us. We see how carefully they study the composition of a picture, and how fastidious they are in their choice of subjects. Whatever advice they give is the correct thing; in short, they are our models. We pin our faith in photography on them. So, ye veterans, beware! You are the hope of the rising generation.

I come now to a few suggestions I have to offer in regard to our outdoor meetings. I would suggest that these should be more frequent than hitherto. We should aim at having at least six during the season—one every month, beginning in April. A day ought to be fixed on which the same should be held; the work done during the season submitted to a suitable party outside the Society, who would adjudicate thereon; that a prize of some sort be awarded to what, in his opinion, possesses the most merit, but no one be permitted to compete who has not attended at least three of the meetings and who has not six pictures to show; and that all those who purpose attending should send their names to the Secretary, who would intimate to such members the times and places as they occur.

I think it is highly desirable that we should begin early; it becomes a very slow process when the meetings are delayed so long, and held when the light gets so poor and the weather so unsettled—when it requires nearly, and in some cases a whole, hour's exposure to be of any use. It is also, I think, very desirable that some such award as I have indicated should be made, for thereby an impetus would be given in the way of a little friendly rivalry, which induces a better attendance and helps to ensure some good work being done. It is equally desirable that a definite time be fixed, which would enable us the better to make our arrangements to attend.

I have thus endeavoured to bring before you something regarding our outdoor meetings, and my aim throughout has been to show the advantages that may be derived from them in thus associating with the members of this Society who attend. As to advantages: we have had line upon line in the charming work (charming alike for picturesque effect and manipulative skill) which it was our high privilege to view in our late exhibition—work which the eye never tired of beholding, and which unfolded fresh beauties by continued inspection (notably so in the frame of "*Picturesque England and Ireland*)" and which should give such an impetus to us all that some good work will be the result on this and succeeding years. James Crighton.

FOREIGN NOTES AND NEWS.

Herr Husnik's New Paper for Photolithographic Transfers upon Metal or Stone.—Herr Max Jaffé on the Production of Bank Notes that Defy Reproduction by Photography.—Herr Aubel's Account of Aubeldruck.—A Cement for Wooden Baths.—Explanation of a Phenomenon Observable in Printing Carbon Enlargements.

In the *Photographischen Notizen* Professor Husnik, of Prague, has an article upon the paper used in photolithography for the transfer of pictures to stone or metal, in which he says he is convinced that the principal reason why photolithography is not oftener employed is the want of a better transfer paper. The two sorts now used, *i.e.*, gelatine and albumen paper, each require different treatment, and, consequently, have each their respective advantages; but these are, on the whole, outweighed by corresponding disadvantages. He, however, has succeeded in preparing a photolithographic paper combining all the requisite good properties and fulfilling every requirement. With it nothing is required further than a stock chromic salt bath, of which, when required, a little may be poured carefully from the bottle without filtration, and only so many sheets floated on it as would be required for that day's use. This operation may be repeated several times in the course of the day, as the paper requires but an hour and a-half to dry and a very short exposure suffices. The pictures are quickly developed, and are not liable to be blotted in the whites. This paper is especially suitable for the reproduction of maps, &c., reduced to one-third of the former size. The paper in question is only prepared from Rive's photographic raw paper, because, for extremely minute and very reduced pictures, it is more suitable than any other sort of paper on account of the equality of the texture. Herr Husnik also gives the details of the difference between the treatment required by, and the advantageous and disadvantageous properties of gelatine and albumenised paper for effecting these transfers, but none whatever as to his method of preparing the new sort from Rive's raw paper.

We learn from the *Mittheilungen* that another new photographic society has been founded at Breslau, and has begun life fully equipped with a president, treasurer, and secretary.

Herr Max Jaffé has found that it is quite possible to imitate by photography bank notes and other papers of value when printed in the hitherto considered inimitable cobalt blue; or, rather, he had been told that such imitation was possible, and verified the truth of the statement by experiment. He did not, however, rest content with this, but continued his investigation of the various actinic powers of colours in order to see whether a really inimitable combination could be made. He has now found several that defy imitation by every test that has been applied to them. Of these he mentions three—cobalt blue upon clear yellow, dark blue upon green, and vermilion upon chrome yellow. The plan he proposes seems to be this:—A device is printed upon the paper in a pale tint of clear yellow; then the whole paper is covered with a plain tint of cobalt blue, upon which the figures, &c., are printed or written. The device printed in the under tint is not expected nor wished to be visible to the eye, but yet has sufficient actinic power to influence decidedly the photographic image. Herr Jaffé is anxious that others should experiment in the same direction, so that his plan might have a practical trial. For this end he embodied the result of his experiments in an interesting paper which he read before the Vienna Photographic Society, and also communicated with the Austrian National Bank. The latter, however, does not feel experimentally inclined at present.

At a recent meeting of the Frankfort Photographic Society, Herr Aubel described his celebrated printing plates, which are the reverse of ordinary etched plates; that is, the lights, or the parts which are not intended to take on ink, are sunk, while the shadows stand out in relief. Further particulars will be found in the account to be given under the heading "Meetings of Societies."

In the *Monatsblätter* the following cement for wooden baths is given:—Melt thirty grammes of colophonium and thirty grammes of yellow wax in an iron crucible (a saucepan will do), and to that add thirty grammes of finely-powdered calcined ochre, and keep the whole mass fluid for some time by stirring. Now pour some into the joints that are not watertight, and when it has cooled it will be as hard as stone.

In the same journal Herr Friedlein, of Munich, gives an explanation of a phenomenon that has been remarked by many workers in carbon. It sometimes happens that an enlargement made from an apparently perfect carbon transparency is so covered with what looks like dirty marks as to be unusable—that is, the impressions from the enlarged negative are so covered with a rough texture that it is scarcely possible by retouching to send them out as even moderately-good pictures; and, as the same result is obtained with all sorts of carbon tissue, it cannot be said that the fault lies with the paper. The cause, Herr Friedlein says, may easily be seen if the transparency be examined under a powerful microscope. The flaws are not impurities, but hollow, tubular canals or, rather, runnels, produced by a difference of contraction between the gelatine and the collodion, caused either by the collodion being allowed to become too dry before the print is drawn off, or merely by the unsuitable consistency of the collodion. The remedy he recommends is to avoid all preparation of the plate from which the print is to be drawn off. He himself has in this way produced thousands of carbon transparencies, and has every reason to be pleased with the results.

Meetings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

An ordinary meeting of this Society was held on Tuesday evening last, the 13th instant,—Mr. J. Glaisher, F.R.S., President, occupying the chair.

The Chairman—having announced that Mr. H. Baden Pritchard had been elected Honorary Secretary in the room of Mr. R. J. Friswell, whose retirement from that office was known to them all—asked Mr. J. Spiller to open a discussion on the silver bath. That gentleman accordingly read a paper, to which we make some allusions in another page, and which we hope to publish in our next number. He then read the following observations written by Colonel Stuart Wortley, who was absent.

Colonel Wortley commenced his communication by stating—The bottle I produce before you tonight contains an ethereal solution of nitrate of uranium which has been exposed for a short time to the action of light. The action of light upon this solution throws down a deposit of urano-uranic oxide, leaving the supernatant liquid in the proper state, either to be added direct to the collodion or after the salt has been crystallised thereout, when the salt will be in a fit state for adding to the nitrate bath. I will not trouble you with unnecessary chemical details, and will therefore simply state that if commercial nitrate of uranium be added to the silver bath, the bath is injured rather than improved; while if the purified salt be added a considerable increase of sensitiveness is the immediate result. It will be remembered that when I first proposed the addition of nitrate of uranium to the silver bath for wet work it unfortunately attracted the attention of a photographer who made trial of the process in ignorance of the qualities of the salt with which he was working, and also apparently in ignorance that both Herr Wothly and myself had pointed out the necessity of purifying the commercial salt previous to using it. The photographer in question added the commercial salt direct to his bath; hence his failure to appreciate the value of nitrate of uranium added to the ordinary silver bath. Fortunately, however, Mr. Peters and other gentlemen approached the subject, bringing to bear upon it the knowledge and thought that was not shown in the work of the before-mentioned photographer, a record of their success having been published in the *Photographic News*; the process is now gradually coming into use, and, from many letters I have received, appears to be looked upon with favour. This may probably be a good opportunity to call attention to a subject which frequently crops up in photographic discussions, namely, the relative sensitiveness of the wet and dry processes; and, as I have made a very large number of comparative experiments on this point during the past few years, I think I am in a position to give an opinion on the matter. We sometimes see statements that certain dry processes are two, and even three, times as sensitive as the wet; but I have never been able to confirm such a statement. On the contrary, although a dry plate can be made slightly more sensitive than a wet plate as prepared by the ordinary processes in use, if an extra-sensitive wet process be used—such as a heavily-bromised collodion, sensitised in a uranium and silver bath—the dry plate can no longer keep up its superiority. It would, in my opinion, be most interesting were the Photographic Society of Great Britain to appoint a committee to investigate this subject of relative sensitiveness. It would, of course, be necessary to keep to published processes, as it would not be of interest to the general body of members for secret formulæ to be brought into the competition.

Mr. **William Bedford**, alluding to an observation by Mr. Spiller in which he spoke of sulphate of silver having been formed in the silver bath, inquired if there were any advantage in getting rid of that salt. With respect to the presence of sulphate of silver in nitrate that had been obtained from residues, he stated that on one occasion when he had converted silver of that kind into nitrate he had selected the finest and largest crystals of which to make a new bath, and found that the sulphate very soon appeared. With regard to the decolourising of the printing bath by the addition of citric acid, he had tried it, but had eventually given it up on account of its exerting an unpleasant influence upon the tone of the prints.

Mr. **G. W. Simpson**, in reply to a question, said that Dr. Vogel had suggested the addition of nitrate of barytes to the bath several years ago as a means of eliminating sulphur compounds.

Mr. **Payne** remarked that about twelve years ago he had accidentally got some cyanide of potassium mixed up with his silver bath, and, after filtering it, he found the bath to work better than it did before. He had published an account of this at the time. The addition of cyanide to the bath was not, therefore, the new thing indicated by Mr. Spiller in his paper. He had some time ago dropped a penny piece into his bath which was promptly removed and the bath filtered, and, as he had found it to work rather better afterwards than before, he inquired if Mr. Spiller would kindly indicate the nature of the change that had taken place.

Mr. **J. R. Sawyer** commenced by regretting the absence of Mr. H. J. Burton of the Autotype works, by whom some of the specimens exhibited by Mr. Spiller has been produced. He had, however, conversed at some length on the subject with Mr. Burton, and the observations he was about to make would include the sentiments entertained by that gentleman. Mr. Spiller had applied to those who did a large amount of work rather than to those who only worked occasionally for specimens illustrative of the change to which the silver bath was liable. With respect to the specimens of crystals exhibited by Mr. Spiller they (the Autotype Company) had come to the conclusion that the sole cause of pinholes in the negatives was due to the presence of those crystals. They all knew that the bath would work well when saturated with iodide of silver in the manner described by Mr. R. W. Thomas in his writings on that subject. They (the Autotype Company) had concluded that pinholes did not arise from the precipitation of iodide of silver, as was once stated to be the case, but from the precipitation of those complex crystals which were stated to be composed of sulphate of silver. In the Autotype Factory they used flat baths of large dimensions, and those were more favourable to the reception of any depositions upon the surface of the plate then when vertical dipping-baths were used. Sometimes when the negatives were quite riddled with pinholes by the filtration of the bath the pinholes quite disappeared, but only for a short season, as they would again reappear. It was their opinion that the presence of minute traces of sulphuric acid in the pyroxyline conduced greatly to the formation of sulphate of silver in the bath, and, as a remedial measure for that evil, they had thought of treating the pyroxyline with a solution of chloride of barium. They had an excellent way by which they could produce those crystals at pleasure:—To the strong mother-liquor obtained after dissolving silver a portion of an old bath was added, when the crystals were produced in large quantities. In making a new bath they added a little old solution of nitrate of silver bath to common water, which was then exposed to the light for some time. It was then made up to the proper strength by the addition of crystals of nitrate of silver, after which a solution of cyanide of potassium was added in such quantity as to cause slight milkiness, when the bath was filtered, acidified, and used. A convenient method of drying crystals of nitrate of silver consisted in placing a glass funnel in a bottle, inverting another funnel of small dimensions in the larger one, and then arranging round the smaller one the crystals that were to be dried. The liquid drained down into the bottle, leaving the crystals to become dry.

Mr. **V. Blanchard** desired to make a remark on the communication by Colonel Stuart Wortley that had been read, namely, respecting the value of the addition of nitrate of uranium to the silver bath. He was one of those referred to by Mr. Peters in the experience narrated by Colonel Wortley; but in the cause of truth he felt bound to say that in any experiments with which he had had to do the addition of nitrate of uranium to the silver bath had not been productive of any increase of sensitiveness. On the contrary, the addition of that salt to the bath had resulted in a slight decrease in sensitiveness. Some time ago he had also witnessed some experiments conducted in his studio, and in the presence of the editors of the two weekly journals along with other gentlemen, those experiments having been instituted with the view of establishing an alleged superiority, as respects sensitiveness, of a method of preparing and keeping in order a nitrate of silver bath. Both Mr. Simpson and Mr. Taylor, who were present at that trial and who were also then present at the meeting, would bear him out in his statement that when he made use of a simple bath composed of nothing but nitrate of silver and water, the results obtained were much superior to those produced by the method then under trial. With regard to the use of cyanide of potassium in the bath, he was strongly of opinion that, as a curative agent in the case of a disordered bath, there was nothing that could surpass it.

Mr. **J. Werge** fully endorsed what Mr. Blanchard had said—that in the making of a new bath nitrate of silver and water alone could not be surpassed. He had listened to Colonel Wortley's communication, and confessed himself to be the individual whom that gentleman had endeavoured to hold up to obloquy. The numerous experiments he had made with nitrate of uranium, and by which the assertions of Colonel Wortley were shown to be groundless, had been published to the world, and they bore out what Mr. Blanchard had said, viz., that the addition of nitrate of uranium to a silver bath was quite useless. But Colonel Wortley was in error in imagining that his (Mr. Werge's) experiments were conducted with commercial nitrate of uranium alone, for he had also made use of that salt when purified in the manner described. Of the large circle of his photographic aquaintaince he did not know one who used the salt, notwithstanding its having been so strongly recommended by Colonel Wortley. Nitrate of uranium was of no use whatever when added to the negative bath.

Mr. **W. England** agreed with Mr. Blanchard that silver and water alone gave a bath possessing the highest qualities. In making a new bath he found it desirable to place it in the sun for as long a time as possible.

Captain **Abney** had tried the addition of nitrate of uranium to the bath, and, while he had found it advantageous in the case of dry plates, he had not discovered that it conferred any sensitiveness on wet collodion plates. In its connection with dry plates there were other nitrates which he thought would answer a similar purpose.

Mr. **F. York** read the following remarks:—I am not one of those happy individuals who never get into trouble with the nitrate of silver bath. It happens very frequently, not from freaks with ethyl compounds, but from exhaustion. Last session I worked in comparative comfort; I found that nitrate of baryta was a panacea for a disordered bath. My mode of treatment was to add a grain of nitrate of baryta to each fluid ounce of solution, boil it for ten minutes, dilute it to its proper strength, put it into the sun until the bath in use gave out. I found that a bath, after repeated treatment, produced clean but weak negatives, requiring double the exposure. I concluded that the best plan was to reduce it with copper, or, as Captain Abney expresses it, to make a new bath out of an old one. I have sent some of the solution after reduction to Mr. Spiller, thinking he may find something not reduced by the copper that may enlighten us. I attach so much importance to the baryta salt as a specific for a disordered bath that I am most anxious to know its chemical action. We are told that a bath giving pinholes, or, as it is most commonly called, a "sandy bath," arises from supersaturation with iodide and bromide. This is, of course, a reasonable conclusion, for by diluting it with water iodide of silver is precipitated. I have used a bath so thoroughly saturated that when poured out it was quite yellow with iodide. Fulminate of silver has been suggested as the cause of pinholes. I am not prepared to argue this point. I find that fulminate of silver consists of silver, oxygen, hydrogen, and nitrogen. The fulminate of Liebig is a cyanate of silver, the cyanagon for the production of the cyanic acid being derived from the carbon of the alcohol, and the nitrogen of the nitric acid. An old silver bath contains all these elements. One of the peculiarities of an old bath is that after standing a few days a crop of numerous transparent needle crystals form on the dipper and sides of the bath. I have seen them a quarter of an inch long. I once collected a small vial full, but cannot find it at present, which is unfortunate, as Mr. Spiller may have detected their composition. I never get them now. We always consider these crystals as iodo-nitrate. Is it so? or is it fulminate? The usual mode of treating a bath in this state is to dilute it, filter out the precipitate, add fresh nitrate of silver to make it the proper strength, or boil it down to that. I have found the nitrate of baryta remove this grievance most effectually. What is the cause? I am unable to do any more than offer suggestions. With regard to the fulminate theory, I am disposed to think there is some foundation for its presence in the bath, as I have often found, when fusing an old bath, a series of sharp detonations when stirring it. I have noticed this more particularly with a bath in which cyanite of potassium has been used to purify it. I am quite satisfied in my own mind of the value of nitrate of baryta in reducing these crystals, and think we ought to know its chemical action. Is it possible that an oxalate of baryta is formed? for I find in The British Journal of Photography that Mr. Williams, of the firm of Hopkin and Williams, discovered in the residues after the distillation of old collodion as much as five grains of oxalate of lime to each ounce of collodion distilled. This is about the weight of the iodising salt used in each ounce of iodised collodion. Is it possible, the editor suggests, that these crystals may be oxalate of silver. I should like to be informed why, when the silver reduced from a bath solution by copper, when converted into nitrate and a bath made from it, should still be saturated with iodide of silver. I once precipitated some old baths as chloride and sent it to the refiners. The metal was returned to me, less the charges for reducing. I made it into nitrate of silver, and, strange to say, when I dissolved it in distilled water it turned yellow, as though iodide of potash had been added to the water.

Mr. Warnerke observed that he had not heard Mr. Spiller's paper, owing to his having come in too late; but from experiments he had made three years ago he believed that fulminate of silver was formed in the bath after long use.

Mr. Spiller said that he had tested such deposits as had been submitted to him, but had not found fulminating silver, although he had struck them with a hammer on a warm anvil.

The Chairman considered that as the evening was far advanced, and there were many more gentlemen who would like to make some remarks on this interesting subject, it would be advisable to adjourn the discussion till the following meeting.

A Visitor made some observations on the difficulty he had once experienced in obtaining a supply of nitrate of silver when operating in New Zealand.

The Chairman, having awarded thanks to the various gentlemen who had contributed to the interest of the proceedings, directed attention to an excellent collection of photographs on the walls, contributed by Mrs. Payne, Messrs. England, Bedford, the Autotype Company, and by himself.

After Captain Verney had made a stirring appeal to the Council to provide a series of albums to contain experimental and other photographs, the meeting was adjourned to the *first* Tuesday in April.

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EDINBURGH PHOTOGRAPHIC SOCIETY.

An ordinary meeting of this Society was held in the Hall, 5, St. Andrew-square, on Wednesday evening, the 7th instant,—Mr. John Lessels, President, in the chair.

The minutes of the previous meeting was read and approved, and Messrs. James Forbes, Crooke, John Crichton, W. B. Mitchell, Archibald Robertson, Purvis, and Kirk were admitted ordinary members.

Mr. James Crighton then read a paper entitled *Our Outdoor Meetings.* [See page 126.]

Mr. W. Neilson said he had listened to the paper with much pleasure. He had some experience of the outdoor meetings, and thought they were a feature of the Society that should be encouraged as much as possible, and nothing ought to be left undone that would draw out the members. He noticed that such meetings were intended to take the place of certain of the ordinary meetings during the summer months, and wished to know if it were the custom to transact business at those meetings, as, if so, it might be that matters of much importance would be decided by a comparatively small number of the members of the Society.

Dr. Nicol replied that for a number of years it had been the custom of the members at the outdoor meetings to constitute themselves into an ordinary meeting, and transact any business that might require attention; but with the exception of the election of candidates for membership almost nothing else was ever done. He thought it might in the future, as it had in the past, be safely left to the good sense of the members who were in the habit of attending such meetings to transact such business only as could not be allowed to stand over till October.

Mr. Dobbie had always experienced a difficulty in finding suitable places at which to hold the outdoor meetings, and thought it would be well if the members generally would send suggestions to the committee to assist them in making arrangements. Unfortunately for himself his business engagements prevented him getting to as many of those meetings as he would like; but from his experience of those he had attended he could assure the members they were very enjoyable.

Dr. Thomson was very glad that Mr. Crighton had brought forward the question of outdoor meetings at the beginning of the season, as he was sure that members only required to be induced to attend one in order to secure their presence at all. It was, no doubt, a matter of importance to select suitable places of meeting, and equally important to have arrangements made, as far as possible, with respect to the order in which the pictures should be taken, as, generally speaking, there was some particular hour at which each view could be better photographed than at any other. If the outdoor committee could previously visit the ground, and arrange as to time and place, much valuable time might be saved.

Mr. C. Sinclair highly approved of the proposed method of increasing the interest attached to the outdoor meetings, and gave notice that at the next ordinary meeting he would propose that a prize be awarded for the best pictures taken at such meetings, and that it be remitted to the Council to consider and report as to how the arrangement should be carried out.

Dr. Nicol gave notice that at the next meeting he would move that a medal be offered for the best paper read before the Society during the current year.

A number of prints, contributed by Messrs. Nimmo and Son, were then balloted for, and the President intimated that at the succeeding meeting Mr. Rodger, of St. Andrews, would read a paper, and give practical illustrations of the platinotype process.

Votes of thanks were given to Mr. Crighton and Messrs. Nimmo and Son, and the meeting was adjourned.

MANCHESTER PHOTOGRAPHIC SOCIETY.

A social meeting of this Society was held on Thursday evening, the 8th inst., when about fifty members and friends partook of an excellent "knife-and-fork" tea. In the absence of the President through domestic affliction, Mr. Thomas Haywood, Vice-President, occupied the chair.

After the routine business had been disposed of,

Mr. W. T. Chadwick exhibited and described a new form of oxygen generator. [See page 124.] He (Mr. Chadwick) also exhibited some charming little views by Mr. Woodbury from emulsion negatives, and mounted by Mr. Woodbury's new corner pieces on a large card. These views were greatly admired, and the method of mounting generally commended.

Mr. Frankland exhibited several of Mr. Wendel Holmes's stereoscopes, which were quite new to some of the gentlemen present.

The walls were adorned by ten large (about 24 × 19) pictures from wet collodion negatives, by Mr. Wormald, of Leeds—very fine and perfect specimens of large work, and which excited considerable interest.

The walls were also embellished by a number of Mr. Coote's well-known excellent pictures.

The meeting then adjourned to the lantern room, where Mr. Chadwick had a pair of Mr. Woodbury's lime-light sciopticons, and exhibited a large number of fine views kindly sent by Mr. F. York, of London, for the occasion. Several dozens of pictures by members of the Society were also shown.

A vote of thanks was passed to Messrs. Chadwick, Wormald, Woodbury, Frankland, York, and Coote; after which, one of the most enjoyable meetings the Society ever held was adjourned.

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WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.

An ordinary meeting of this Society was held at the Odd Fellows' Hall, Bradford, on Monday, the 5th instant,—Mr. E. Wormald in the chair.

The minutes of the previous meeting having been read and confirmed, the following gentlemen were elected members of the Society:—Mr. Dear (Bradford), Mr. J. W. Sykes (Dewsbury), Mr. J. Garrett (Dewsbury), Mr. L. Abell (Leeds), and Mr. Turner (Leeds).

Mr. A. Crabtree gave a lantern exhibition, using a pair of the newest lanterns out.

A good assortment of slides was shown, comprising continental, American, Irish, and a few (by some of the members) of Yorkshire, scenery.

A vote of thanks was given to Mr. Crabtree for his entertainment, and the meeting was adjourned.

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BRISTOL AND WEST OF ENGLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

The ordinary monthly meeting of this Association was held on Wednesday, the 7th inst., at the Museum and Library, Queen's-road, Bristol,—Mr. W. W. Stoddart, F.C.S., F.G.S., &c., President, in the chair.

The Secretary having read the minutes of the previous meeting, which were confirmed, the Chairman called on Mr. P. J. Worsley, one of the vice-presidents, to give his experience with the waxed-paper process.

Mr. Worsley did this in a most interesting manner, illustrating his remarks with a great many very fine pictures, both large and small, done by the process. He (Mr. Worsley) urged the great convenience of being able to work with such a small amount of *impedimenta*, and thought that the pictures being printed on plain paper was a decided advantage in the case of large work, besides being more artistic. He had found that a very fine effect was produced by printing large pictures on the rough paper used for water-colour drawing. While admitting the disadvantages, such as length of exposure, &c., he considered the advantages gained by the process quite counterbalanced them.

The Chairman asked in what manner the waxed paper was supported for exposure.

Mr. Worsley said the paper was fastened to a mount of cardboard.

Dr. Thompson inquired if the development were carried on with gallic or pyrogallic acid.

Mr. Worsley replied that he had always used gallic acid.

In answer to a question by Dr. Thompson as to how long he had kept the paper prior to development,

Mr. Worsley stated that he had kept it a fortnight, and even longer.

Mr. Webber, who said he had worked the waxed-paper process, considered the exposed paper lost definition if kept long prior to development.

Lieut. Pusey inquired if it were possible to intensify easily.

Mr. Worsley had always found that no intensification was required; the difficulty was to prevent too much intensity.

Mr. H. A. H. Daniel begged to be allowed to differ from Mr. Worsley in one or two remarks he had made. He could not agree with that gentleman that a rich sepia tone could not be got from albumenised paper, as he had found that if set about the right way any tone, from brick-red to black, could be got. He (Mr. Daniel) also considered the slowness of the paper process a great and almost fatal drawback, as it rendered animal life in pictures an impossibility, and he thought landscape work without any animal life introduced, as a continual thing, would soon lose much of its charm.

Mr. E. Brightman then exhibited a number of very fine negatives, the property of Mr. Warnerke, and executed on his tissue. He (Mr. Brightman) spoke of the great value of the tissue for copying prints, the negatives being formed at once by superposition. He fully explained the *modus operandi.* [The negatives, which were of a very fine description, were greatly admired, and surprise was manifested at the toughness of the tissue.]

After some further discussion on the two processes brought before the meeting, and a cordial vote of thanks to Mr. Worsley for his very interesting account of the waxed-paper process, and to Mr. Warnerke for kindly sending such a good collection of negatives, the meeting was adjourned.

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BERLIN PHOTOGRAPHIC SOCIETY.

At a meeting of this Society, held on the 19th January, Dr. Vogel, the President, commenced the proceedings by reading a letter from Herr Adolf Ott, dated New York, in which the writer claimed for Herr Kurtz, of that city, the honour of having invented and exhibited in 1868 a photochromolithographic process identical with that recently perfected by M. Leon Vidal. The reading of this letter gave rise to no discussion, and immediately after Dr. Vogel laid on the table a print from a porcelain plate.

Herr Grüne said the process was already known to him. From an unglazed porcelain plate, if it were not burnt too hard, impressions could be got, though not in such numbers as from a lithographic stone.

A photograph of an interior taken by magnesium light gave rise to a discussion on the best method of lighting interiors in order to photograph them, in which several members took part.

Dr. Vogel, from his experience in photographing the interior of Egyptian temples, thought that magnesium light was useful only in exceptional cases, as it did not light satisfactorily objects more than twelve feet from the camera, and the dense smoke evolved soon obscured even the well-lighted objects.

Dr. Weissenborn recommended as an exceedingly powerful light that produced by the burning of phosphorus in molten nitre.

Dr. Vogel thought the experiment would be dangerous, as the violent action induced would cause the molten mass to spirt strongly.

Herr Schaarwächter showed two of Seavy's backgrounds, which he had ordered from New York. The cost of each, inclusive of transport, was about £5. They were both interior backgrounds, and at the first glance their excellence was recognised by all present. Where the head should show against them they were light in tone, yet not altogether without shading, so that the lighted side of the head might be posed against a dark part of the background, and the side in shadow against a light. The pattern on the one background represented tapestry and that on the other a wall paper.

Herr Prümm regretted that no photographer in Berlin devoted himself exclusively to making enlargements for the trade, the consequence being that they had to be made abroad, customers having to wait a very long time for the execution of their orders. He had sent some negatives to Herr Winter, of Prague, and six days after he received three perfectly successful enlargements. Herr Winter worked with artificial light produced by a Siemen and Halske's rotating machine, kept in motion by a small steam engine, furnishing a light equal to 1100 candles. An exposure of a few seconds was sufficient. The negative need not be larger than an ordinary *carte,* the image being projected directly upon paper and developed. The sizes varied from double sheet to a sheet or half sheet, and the respective prices were eighteen, ten, and six shillings.

Herr Reichard remarked that at the same prices Herr Harnecker, of Wriezen, furnished enlargements that gave the greatest satisfaction produced by means of a good petroleum lamp, a silvered reflector, and a conical mirror, in fifty or sixty seconds.

Herr Kunze said that Herr Norden also used a petroleum lamp.

The discussion was continued for some time longer.

Herr Richter, who had previously requested members to bring with them untoned prints upon blistering paper, showed the effects of his anti-blister specific. He divided the contributions into two portions, one of which he toned and fixed in presence of the meeting, in the usual way, and when washed they were quite blistered. The second portion he placed first in a solution of unknown composition, then washed, fixed, and washed them again, they still remaining free from blisters.

In answer to Herr Prümm,

Herr Richter said the substance in question had no injurious effect upon the pictures, as he had had some treated with it in his show-case for nearly a year.

Herr Prümm then asked for what consideration or under what conditions Herr Richter would publish his remedy.

Herr Richter said he had not yet considered the matter.

Herren Prümm and Boll then begged Herr Schaarwächter to send them some of his blistering paper, as they believed they could also remedy the blistering.

The proceedings then terminated.

At a meeting of this Society, held on the 1st ult., after the admission of two new members the President (Dr. Vogel) called attention to the bad effects of the action of impure ether, which appeared to give rise to more complaints now than formerly.

Herr Quidde said that in September and October last he had been annoyed by a fault very difficult to remove. It consisted of parallel diagonal lines, generally in the centre of the plate. The lines were quite different from the well-known cross-hatching strokes. The fault to all appearance lay in the ether, which, without acid to react upon, coloured the collodion in an abnormal manner. When better ether was used the fault disappeared.

It was remarked that several of the old manufactories of ether had ceased to exist, and that new firms had sprung up in their place—a change that might have something to do with the difference in quality of the ether.

The Chairman then showed a collection of very successful microphotographs, produced by lichtdruck and printed in the natural colours.

Herr Schaarwächter gave in his report on his experiments with Herr Tiator's retouching powder. First, he applied it with a pencil to albumenised paper, but without any effect. Then he rubbed it with his finger upon a print, and, in consequence, the picture became somewhat dull, but he did not observe any increase of susceptibility to retouch. He did not try it upon a negative.

Herr Becker had tried it upon some negatives, but had not found it to possess any advantage. He did not gain anything more by so doing than by rubbing with the bare finger, except that particles of the powder were apt to stick to the plate and cause spots, which were difficult to remove. The powder was undoubtedly a resin, as anyone might see if he melted it by holding it to the light.

Dr. Vogel then read a letter from Herr Richter, in which that gentleman said he had used iron as an intensifier exclusively for several years, and found that it had many advantages. For this purpose he did not use the developer, but a five-per-cent. iron solution to which was added from two to three per cent. of citric acid and a little salicic acid, which prevented the formation of fungus for weeks, even in summer. (Salicic acid alone would do to intensify with, but its hyacinthine colour is unpleasant; a little citric acid makes it colourless again.) An actually under-exposed plate may be saved by this method of intensification with a silver solution of 1·50. An over-exposed plate may also be assisted. Fix immediately after developing until scarcely a trace of the picture remains, then intensify and fix again. Dr. Vogel remarked that when travelling he generally used his iron developer as a strengthener, and thus saved the trouble of carrying pyrogallic acid.

Herr Schaarwächter generally intensified with iron also, but used a stronger solution than for the developer. The silver he replaced with tartaric acid.

Herr Quidde had often had great trouble to obtain the requisite intensity for reproductions with an iron intensifier. He, therefore, thought it suited for landscapes and portraits, but unsuited for reproductions.

Herr Norden showed three extremely beautiful carbon enlargements, and gave the following account of the method by which they were produced:—An ordinary silver positive print is enlarged by lamp-light on a dry plate, and the negative so obtained is printed from in carbon. The enlarged negative gets as much retouching as is called for, so that the final prints should not require working up. The three enlargements shown measured 48 × 56 centimetres, and Herr Norden did not care to make them much larger, as the fine transfer-paper was not made in a wider width.

Herr Liebmann showed a number of enlargements upon albumenised paper, produced by enlarging the original negative upon an ordinary wet plate, and from this enlarged collodion transparency a carbon negative is printed in a printing-frame and transferred in the usual manner to glass. In this way the granularity of the carbon transparency was prevented.

Herr Boll said that he had experimented with the paper inclined to blister which Herr Schaarwächter had given him at the previous meeting, but he had got *no blisters,* and so was unable to try his remedy for blisters. He, however, very seldom got blisters at all. This immunity he attributed to his fixing bath, which he made of soda 1:32, and allowed the pictures to lie in it from fifteen to twenty minutes.

Herr Grüne thought the soda bath too weak, and that the pictures would be apt to be removed before they were properly fixed.

Herr Boll assured Herr Grüne that his pictures would keep for years without fading.

Herr Prümm said that in conjunction with Herr Richter he had tried the latter's specific against blisters, and could certify that it was perfectly efficacious. Herr Richter had expressed his willingness to publish his formula in consideration of certain payments, further particulars as to which would be given hereafter; meantime the Dresden paper manufactory seemed disposed to pay a pretty large proportion of the sum required.

Herr Marowsky had taken home with him some of the pictures treated by Herr Richter, at the last meeting, with his unknown compound, and on steeping them in water he got some blisters at last on one picture.

Herr Siemsen, of Hamburgh, prevented blisters by using warm water after fixing.

Herr Roloff found that this same treatment only increased the number of blisters.

A query as how to remove iron stains from linen, and another as to the arrangement of an enlarging apparatus, having been answered, a committee was appointed to arrange for a winter entertainment or *conversazione* without ladies, and the meeting shortly after broke up.

Correspondence.

GELATINE *VERSUS* COLLODION.

To the Editors.

Gentlemen,—The evidence given by Mr. Kennett in your last issue will probably be noticed by Mr. Berkeley as entirely confirming his view that gelatine is not *necessarily* a more sensitive vehicle for emulsion than collodion.

It appears that Mr. R. M. Gordon places gelatine and collodion emulsions in just an equal ratio of sensitiveness as compared with wet plates; so that question may be considered as disposed of, and we have to thank Mr. Berkeley for exploding the false notion that the most sensitive emulsions *must* be made with gelatine.

Mr. Kennett, from some remarks in his letter, seems not to have noticed that the instantaneous pictures taken by Colonel Stuart Wortley at the Naval Review *were* on uranium dry plates. As to Colonel Wortley's processes for rapid work generally I cannot speak (like Mr. Kennett) with certainty; and can only judge of what he uses from published documents, one of the latest of which I find to be an "award of merit" received by that gentleman from the Philadelphia Exhibition, and signed by, among others, the well-known Dr. H. Vogel "for artistic landscape studies, and technical excellence of uranium dry plates," on which plates it is, therefore, to be presumed that Colonel Wortley's instantaneous and other views were taken.

With regard to Mr. Kennett's proposal for a "tilt," he seems not to see that my letter was merely to remind Mr. Berkeley of a point of fact (which I thought he had forgotten) in connection with what that gentleman calls the "*published* processes." One could hardly expect the readers of a scientific journal to be edified by the account of a "tilt," for the point of rapidity only, in which one of the processes in competition was kept a secret, or worked commercially under the protection of a patent, by Mr. Kennett. I, for one, would not lay myself open to the charge of presumption by being a party to such expectation, nor by expecting that you would trouble yourselves to determine such a point at issue.

Independently of these reasons, however, I consider that my letter, written as it was for the above-named purpose, hardly justified Mr. Kennett in challenging me individually. Challenges on behalf of commercial processes are at present fashionable in the advertising columns of your valuable Journal, and are generally "open to all comers"—surely a more appropriate form of challenge, or, at all events, one more likely to determine satisfactorily a vexed question.

Perhaps, however, Mr. Kennett is actuated by a more liberal spirit in this matter than I have supposed, and has spoken, not so much in the cause of advancement of (his own) science, as in that of general usefulness to the photographic public—quite as worthy a motive, and one for which I trust you will allow me space to inform Mr. Kennett that I am more willing to act with than against him, by joining him in giving a prize of £50 (£25 each) to the commercial dry-plate maker in England who shall produce the best ready-prepared dry plates, possessing the most desirable combination of good qualities, including, more especially, facility of development, ample rapidity, clean films, control of or freedom from fog, capability for intensification without trouble, keeping well both before exposure and between exposure and development, &c., &c.—in fact, all such qualities as render dry plates certain and reliable instruments for the work they are most in vogue for, namely, landscape and outdoor photography, and I would also add transparency work.

I have proposed the prize to be for "ready-prepared plates," in order that no "vested interests" of a manufacturer should be interfered with, as would be the case if contesting simply the merits of processes—*e.g.* the late competition in France.

Competitors engaging to pay an entrance of £5 or £10 each, to be added to the prize; and if you, gentlemen, consider this project a sufficiently beneficial one to photographers, perhaps you would for once waive the "advancement of science" in favour of commerce, and undertake the troublesome and responsible duties of umpires, as proposed by Mr. Kennett. Conditions and terms to be arranged by yourselves.

If Mr. Kennett think that in making this offer I am actuated by the same spirit as himself in his challenge to me he will not object to my proposition. In case, however, his reasons be purely scientific ones, I have reason to believe that Colonel Wortley, with whose name Mr. Kennett does me the honour of coupling my own, is at present, through a recent severe railway accident, unable to attend to the question. But I may add my opinion that, after having "tilted" against and defeated one so eminent as Mr. R. M. Gordon, he (Colonel Wortley), before entering into another contest, might ask to be pitted against "a foeman worthy of his steel."—I am, yours, &c., Herbert Kerr.

11, Charles-street, St. James's, S. W., March 13, 1877.

THE RECENT EDINBURGH PHOTOGRAPHIC EXHIBITION.

To the Editors.

Gentlemen,—My attention has just been drawn to a paragraph in your Journal of the 9th March, headed *Edinburgh Photographic Exhibition.*

Allow me to say that there is nothing whatever in the minutes relating to the late exhibition authorising such a charge to be made on exhibitors as that indicated in the paragraph referred to; neither is there any entry, so far as I can trace, in the Treasurer's accounts of a sum of this description having passed through his books. Whatever charge, therefore, of this nature was made was made by Dr. Nicol, as *Superintendent* of the Exhibition, wholly on his own responsibility. The exhibition council, so far as its records show, neither authorised nor knew that any such charge on exhibitors had been made until attention was directed to the fact in the pages of your Journal.

As Dr. Nicol is at present from home I have been unable to consult him with respect to the foregoing. I leave him, therefore, to give his own explanation of the matter.

I am sure I express the regret of every member of the exhibition council that any one of the large number of exhibitors should have had cause to complain of the way the exhibits were returned. The unpacking and repacking of the contributions was entrusted to the care of one of the largest and most experienced firms in this city; and, as most of the work was executed under the immediate care and superintendence of one of the principals of the said firm, I hope the instance referred to in your paragraph is the only solitary one.

The above is written in the interest of the late exhibition, and on my own responsibility.—I am, yours, &c., Malcolm G. Dobbie,

Joint-Secretary of the Edinburgh Photographic Exhibition.

Edinburgh, March 13, 1877.

[The officer to whom was entrusted the management of the exhibition doubtless considered it within the scope of his duties to make such minor pecuniary arrangements as were necessary to effect the proper carrying on of the exhibition without consulting the Society. Here the matter had better be allowed to rest.—Eds.]

May's British and Irish Press Guide.—The fourth annual issue of this work is replete with useful information concerning the outcome of that great power in the world—the fourth estate. This guide contains a complete list of all the newspapers, journals, monthlies, and quarterlies issued in this country, and this compendium of press knowledge is so admirably systematised as to enable anyone to speedily discover the names, prices, days of publication, addresses of publishers, and other useful information connected with newspapers or periodicals issued in any part of Great Britain and Ireland. It is only when one glances over an admirable *Press Guide* like that before us that an adequate idea of the vast extent of the periodical literature of our country can be realised.

Bank Note Forgery.—The *Daily News* has been moralising on the forgery of bank notes by means of photography. Photographers, says our contemporary, are certainly very clever people. The most recent feat that they seem to have successfully accomplished is the reproduction of the blue notes of the Bank of France and the red ones of some of the Scotch banks. Both red and blue have for a long time been deemed sufficient to baffle such professors of the black art as strive to compete with Government and bankers in the production of these valuable documents. The National Bank at Vienna has, however, it appears, lately been much troubled with forgeries of the familiar cobalt blue notes of the French, while from Scotland we hear of genuine and imitation notes being pinned together so like one another as to deceive all but the most experienced. The colours are not, of course, reproduced by the camera as they appear to the eye, for the supposed safety in the employment of blue and red upon bank notes was that the former comes out very light in a photograph and the latter very dark. Science has, however, recently shown that the effect of colour upon a sensitive plate may be increased and diminished at will. A German chemist has plainly demonstrated that, by tinting the collodion used in taking a picture, or by employing glass plates of different colours, objects may be vividly photographed which, under ordinary circumstances, would be only faintly depicted. At the Bank of France, strange to say, whose notes have been so freely copied, there is a photographic establishment where a good deal of useful work is done in the way of discovering forgeries, the sharp eye of the camera being a most searching detective. The slightest erasure upon the surface of a cheque, or the alteration of a figure which is imperceptible to the eye, is at once made apparent by photography. Colour, it would seem, is after all but very little protection, for the English bank note is nowadays very rarely imitated, and the same may be said of the German paper money, which is printed in black and white. A combination of colours, laid one over another, has been suggested, and would probably render the difficulty of copying by means of the camera almost insuperable; but it certainly behoves us in these days of experiment and discovery to be very careful in our estimate of the impossible.

EXCHANGE COLUMN.

No charge s made for inserting these announcements; but in no case do we insert any article merely *offered for sale,* that being done at a small cost in our advertising pages. This portion of our columns is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

I will exchange a good rotary cabinet burnisher, cost £3 10, for a whole plate portrait lens, head-rest, or 18 × 14 bath.—Address, J. Keen's, 192b, Mare Street, Hackney, E.

Wanted to exchange a dark tent, Rouch's principle, which has not been used; size, when closed, 30 × 18 × 8; for a wide-angle rectilinear lens or bellows camera, 12 × 10. Also a Ross's stereo., with lens complete, in box, for anything useful.—Address, J. Schofield, Heaton Mersey, near Manchester.

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ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

Notice.—Each correspondent is required to enclose his name and address although not necessarily for publication. Communications may, when thought desirable, appear under a *nom de plume* as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

Horatio Ross.—We shall write privately.

C. P. P. A.—We have never heard of such a solution.

Capt. Gubbins.—The lens must be defective if it cannot cover a quarter-plate sharply.

A. Hollis.—We are not familiar with the use of perchloride of iron in connection with carbon printing.

Thos. Wood.—No license is said to be necessary; but you should consult the Inland Revenue officer in your town.

J. S. (Manchester).—The notice to which you refer has no reference to any new discovery, but is merely a "puff."

Nemo.—Boil the bath for a quarter of an hour, then add a *little* solution of citric acid, shake well, place in the sun for a few hours, and filter.

P. C. Stortz.—We regret our inability to answer your query relative to the number of photographers there are in England, Scotland, and Ireland.

Received.—*Photographic Mosaics;* and the two first numbers of the *St. Louis Practical Photographer,* a new monthly journal, edited by Mr. J. H. Fitzgibbon.

Quiz.—Our remarks had reference solely to the quality of the pictures present at a particular exhibition, and must not be construed in either a prospective or retrospective sense.

James Edwards.—We can now affirm definitely that the fault lies in the water, not in the silver. In what kind of vessel do you mix your solution? Your case is the most puzzling of which we have ever heard.

"Geordie."—The photographs may be sent through the post with perfect safety if wrapped round a stick made of any light wood. In wrapping them up let the albumen side of the paper be next to the wood.

"Thomas."—This correspondent writes as follows:—"Will Mr. W. B. Bolton please give the formula he has found most suitable for developing plates prepared by the process described on page 471, in last volume?"

Countryman.—The two gentlemen to whom you refer as occupying a prominent position at the meeting of the Photographic Society of Great Britain at which you were present are the representatives of the weekly photographic journals.

A Perplexed Principal.—It certainly does require a little courage to say "no" under the circumstances you describe; but until you can muster up the requisite amount of courage to do so your position will be both false and unpleasant.

X. J. V.—Although we have not had an opportunity of examining the lens marked 1 on your list, we believe from what we know of its construction that it will be more suitable for your purpose than 2. It will certainly act with greater rapidity.

A. J. C.—1. The only remedy we can suggest is the application of the substratum by means of a clean sponge with slight friction.—2. Any of the manufacturers of apparatus in London will construct such a chest as you require. They are all familiar with such work.

M. L.—Crystal sheet glass is much more liable to become decomposed than ordinary crown glass. On examining the sample handed to us—which, by the way, was very dirty—we found well-defined irridescent markings, which did not disappear upon being rubbed with a soft cloth. There was a peculiar saline taste apparent upon applying the tongue to the surface of the glass. The instability of such glass has been long recognised. We advise you to use the stock in your possession solely for the purpose of covering miniatures or other portraits, the delicate tints of which would suffer if covered by glass of a greenish hue.

Alpha.—Herr Steinheil, of Munich, was the inventor of the lens described in the fifth page of your letter. You are at perfect liberty to construct a lens of a similar kind *(if you can)* without infringing any existing patent.

P. W. H. D.—We might answer your query by advising you to purchase a background ready prepared from any of the numerous dealers in such accessories, but believe that we shall better meet your requirements by saying that if a blanket be suspended on a line and the sitter placed six feet in front of it, the desired effect will be secured.

Typo. (Fleet-street).—Having made the drawing and obtained the electro-relief from it, mount the copper relief as if the whole subject were to be utilised; and then remove, by means of a saw, the portion in the corner that you do not desire to appear in the book. Your own artistic taste will dictate a suitable arrangement for what remains.

An Old Subscriber (Liverpool).—It is quite true that iodine is only soluble to a limited extent in water; but if you previously dissolve in the water a little iodide or cyanide of potassium its solvent properties are greatly increased. Let the solution be rather strong, and mix with it enough gum water to enable it to be used with a quill cut for writing.

P. Morren.—Previous to applying the developer let the plate be immersed in water for a few seconds, or until such time as you perceive the glycerine becoming evenly wetted. Then, having mixed a few drops of a solution of nitrate of silver with the developer, apply it to the plate. This will bring out a vigorous image, which will not require any further intensification.

John Forbes writes:—"I am very anxious to know if carbon printers are troubled with poisoned and ulcerated fingers. I have tried carbon printing at different times and succeeded very fairly, but the punishment I have experienced has been fearful. My fingers are now very bad. Can you suggest a remedy? What eases me most is putting them in hot water."—Will any carbon printer kindly reply to this query?

Alexr. Irvine.—The form of magnifier you suggest may be very useful in the examination of objects which can be held in the hand, but is unsuitable for being used as a focussing-glass for the camera. The most convenient form of magnifier for focussing is that of a watchmaker's eyeglass; by means of a little practice this can be firmly grasped by the muscles surrounding the eye, and when the glass is used in this way both hands are placed at liberty.

E. Belcher, Jun.—Not having visited the East we are necessarily unacquainted with many specialities connected with what you designate "taking faces in the sandy deserts of Syria;" but from what we have heard, added to what we personally know, it may be presumed that you need not experience much difficulty in photographing the nomadic patriarchs who dwell in tents in the deserts you are about to visit. We merely give you here the following key-notes to success in photography combined with pleasure in travel:—Washed emulsion, a moist preservative, concentrated solutions for developer, and transfer paper. On each of these we might elaborate, but prefer, instead, to refer you to what has recently been written on these topics in this Journal. For the topographic information connected with Abrahamic travels we refer you to any good biblical encyclopædia.

☞ **Editorial Communications should be addressed to "THE EDITORS"—Advertisements and Business Letters to "THE PUBLISHER"—at the Offices, 2, York-Street, Covent Garden, London, W.C.**

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"Imprimatur" Plate.—Under this name Messrs. Shrewsbury, Howard, and Co., Birmingham, have brought out a glass specially prepared for photographic purposes. From samples which have been submitted to us we can fully confirm all that has been said in its favour by those who have tried it. The surface is very smooth and hard, and the body of the glass singularly free from blemishes. We can also compliment the firm upon the excellence of the glass plates prepared by them for microscopic purposes, than which we have never seen any better.

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METEOROLOGICAL REPORT,

Observations taken at 406, Strand, by J. H. Steward, Optician.

For the Week ending March 14, 1877.

These Observations are Taken at 8 a.m.

March.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks.
8	29·93	N	33	35	40	33	Cloudy
9	30·12	N	32	35	42	31	Foggy
10	30·14	SE	32	34	39	32	Dull
12	29·95	W	39	40	49	32	Dull
13	29·78	NW	42	46	50	39	Cloudy
14	29·91	W	47	50	—	45	Cloudy

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 881. Vol. XXIV.—MARCH 23, 1877.

HIGH-TEMPERATURE PYROXYLINE.—SENSITIVENESS AND DEVELOPMENT.

In continuation of our experiments with the two samples of pyroxyline described in our article of last week we endeavoured to trace to its source the difference in behaviour of the respective films under development. This difference we found to be virtually in favour of the less organic sample in point of sensitiveness as well as in other qualities which combine to form a good emulsion; and, though the latter result was in accordance with what might have been predicated, we were unable to reconcile an increase of sensitiveness with the facts already established in connection with such a description of cotton.

We may here state, however, our opinion that the question of relative sensitiveness is one which is involved in a great measure in obscurity, and that a correct idea upon the subject can only be arrived at by a careful study of the attendant circumstances of development and character of deposit. We frequently see it stated that such and such a process yields films which, with an extremely short exposure, give the greatest possible amount of detail, even in the deeper shadows, though the further information is, probably, withheld as to whether such detail is utilisable for printing purposes. Some plates possess the peculiarity of becoming impressed under a remarkably brief exposure, but the image so formed is incapable of acquiring strength under the ordinary conditions of development, and, consequently, it is possible to produce a negative which to the eye appears fully exposed and abounding in detail, but which, when submitted to the ordeal of printing, gives a result of the "soot and whitewash" type. It is found, in fact, that though a certain minimum exposure is sufficient to *impress* the film, a proportionately longer time is necessary to confer upon the feeble image the power of gathering strength under either alkaline or silver development.

Another disturbing element in calculating the relative sensitiveness of a film is the rapidity or ease with which the image is developed. In this respect very great difference is observable in plates prepared by different processes, and we fear there is a tendency to ascribe to certain processes the quality of sensitiveness when, in reality, the effect is merely due to facility of development. Again: some films are liable to veil or fog under the protracted action of the developer; while others, on the contrary, exhibit no such symptoms however long the development may be continued. Now it is evident that, provided we have two plates answering to these opposite descriptions and equal in point of sensitiveness, a greater amount of detail and, therefore, an appearance of fuller exposure must be expected from the one which will best bear a forced development.

These views were suggested and, in a great measure, corroborated by the following experiments:—Two plates were prepared, one from each sample of pyroxyline, and exposed under precisely similar conditions. After moistening with dilute alcohol and washing they were plunged simultaneously into a dish containing alkaline pyro., when the peculiarities of the two plates appeared in forcible contrast. After the lapse of a few seconds the image commenced to appear upon the plate prepared with the "high-temperature" cotton, and was almost immediately visible in all its parts, forming a delicate picture with abundant detail. In the course of three or four minutes the image thus formed continued to gain density, but little, if any, more detail appeared than was present at first. The other plate was much slower in development, no trace of an image making its appearance for at least thirty seconds, and then only the portions which had received the fullest exposure. But here the great difference between the two plates became evident, for, while the first flashed out almost instantly and was at once complete in all its detail, the second came gradually, fresh detail appearing every instant, and it was not until three or four minutes had elapsed that an effect equal to number one was attained. At this stage the plates were removed from the solution and washed.

We have spoken of an equal effect having been produced, but this expression requires qualification. It is true that as regards detail the two images were about equal, but when compared in other respects a marked difference was noticeable: the first plate was more uniformly dense than the other, but in the latter the most strongly impressed portions were slightly more intense, while the finer details were, by transmitted light, much less so. A much wider range of tone existed in the latter plate, the image possessing a crispness which rendered the other flat in comparison. A fresh quantity of solution was then prepared containing a large dose of alkali and of restraining bromide, and the two plates again immersed; and, as the intensification progressed, fresh additions of pyro. and alkali were made as occasion required. This portion of the operation was no less characteristic than the first; the image upon the more organic film acquired density with greater rapidity than the other, but it was remarkable that upon the addition of a fresh quantity of ammonia to the developer there was a sudden accession of strength and not a steadily-progressive action. The character of the intensification of this plate was very similar to the development, and appeared to consist of an almost uniform strengthening of the already existing deposit. The second plate behaved in a very different manner, the intensification being so slow and gradual as to lead to the impression that the solution had no action. It was only after some minutes it became evident how much the vigour of the image had been augmented, and this not in the same uniform manner as in the previous case, but so as to preserve the relative values of the various grades of tint in the picture. In the one case the impressed silver appeared to exhaust almost instantly the power of the developing solution, which after the first effect seemed incapable of exercising any further influence until a new addition of alkali was made; in the other the action was progressive and continued until the solution was entirely exhausted.

We have frequently noticed a great difference in the behaviour of plates under development similar in character to the above; in some cases the feeble image which is obtained by the first application of the developer appears to have quite exhausted the power conferred upon the film by the action of light, while in others the action may be pushed to almost any extent. We have usually attributed this difference to the employment of an excess of silver or the opposite in the preparation of the emulsion; but it would now appear that the pyroxyline has some influence in the same direction. It is well known that excess of silver in emulsion conduces to sensitiveness but that the impressions obtained are feeble and difficult to intensify, while the opposite conditions prevail if the soluble bromide be in excess. The extremely sensitive films produced by excess of silver appear to be acted upon almost instantaneously by the developer, the porous character of the collodion lending aid to the rapid reduction, while with free bromide as a restrainer, or with a less porous collodion, the action is more regular and, it would seem, more satisfactory.

There can be no doubt that the rapidity of development has a material influence upon the resulting picture as regards printing qualities. An examination of a number of plates produced by quick and slow development will speedily prove this; and our contention now is that a practical effect of increased sensitiveness may be also obtained, and this by employing a slow development. But it unfortunately happens that some films cannot be developed slowly except a very large proportion of restraining bromide be employed, in which case the object is entirely defeated. Here an advantage may be obtained from the use of a non-porous collodion, or by the addition of a suitable substance to decrease its permeability.

We have derived considerable instruction from the experiments with these two forms of emulsion, and are fully convinced that, at least for washed emulsion, the "hornier" the collodion within certain bounds the better will be the result in every way—first, on account of the greater resistance to the solvent action of the water in washing, by which the organic portions of the emulsion are preserved; and, second, on account of the modified action of the developer upon the non-porous film, by which the image is formed more gradually and of a much higher textural quality. The substitution of a horny pyroxyline for the high-temperature cotton now in vogue involves no additionable trouble or expense, but rather the opposite, as it brings the preparation of that article within the capabilities of those who are but little versed in chemical manipulation, requiring, as it does, so much less exactness in the matter of temperature and in the strength of the acids. To our experimental readers we strongly recommend a trial.

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PURE WATER.

The necessity for pure water for all photographic purposes has from the earliest photographic times been insisted upon most rigorously, and in most formulæ where water finds a place we observe the prefix "distilled." Yet here and there, even in solutions of such vital importance as the silver bath, there have been daring innovators who have recommended the use of common, well-filtered spring or river water; and we are free to confess that there is much to be said in favour of this recommendation, notwithstanding its apparent heterodoxy.

It is hardly necessary to state that the object of distilling water is to obtain it free from the mineral salts and organic matter that usually accompany it when obtained from spring or river. We are, however, forced to ask—With what frequency is it produced so free from these contaminations? What special precautions are taken to free it from ammonia, for instance, free or combined; or to avoid the production of volatile organic compounds through the over-heating of it at some stage of the distillating process? And we should be fain to reply to our own queries—In very many instances no such precautions are taken.

Too frequently the whole of the condensed products are collected without any attempt at separation of the first and last portions. The stills themselves are not emptied and cleaned too often. The fire is often urged with such vigour that the ebullition actually drives over considerable drops of the unvapourised fluid, which mingles with and contaminates the rest. To our own knowledge "distilled water" is often simply the "steam water" from some stationary engine, commonly enough contaminated with greasy products from the bearings of the various parts of the engine. We are inclined to believe that in few establishments available to photographers are there stills fitted for water distillation entirely.

Then, again, the chemists, to whom the bulk of photographers have to apply for distilled water, are not sufficiently aware of the necessity for more than chemical cleanliness. We remember a case of a professional photographer who had two baths of half a gallon each entirely ruined by his stock bottle of distilled water having been filled by an apprentice boy through a funnel which had been recently used for medicated water. We know of a still at this moment in a large county town upon which the chemical and photographic neighbourhood depend for pure distilled water, wherein, turn by turn with the distillation of water, dill, anise, carraway, or other seeds are thrown in for the production of the respective medicated waters. The most probable results from water so produced is obvious to the meanest capacity—the volatile essential oil which is prepared, and of which it is so difficult to free a vessel, being the most likely means possible to act as a reducing and, of necessity, a fogging agent. We could lay our hand on another still where the condenser is simply a huge stone reservoir, replenished when empty by steam admitted through a pipe attached to a steam-engine boiler. We believe we are correct in saying that it has been emptied and flushed out at least once during the last six years.

As to rain water itself, as collected in towns, it is a delusion and a snare, for it is full of ammonia and carbonic acid, and, as usually stored or collected, teems with vegetable and insect life; it is only necessary to add a minute crystal of silver to a small vial full of it—especially if it be afterwards placed in the sun—to become quickly aware of the extent to which it is contaminated.

We have said enough to prove that distilled water, as frequently obtained, is not that thing of purity it is so fondly imagined to be; and now, having discovered a disease, we may be reasonably expected to point out a cure for it.

We can only say: either make your own distilled water, or, failing that, and the obtaining of satisfactory samples from your dealer, do your best to purify the supply from well or main from organic matter, and disregard the slight waste of silver (which need not really be a waste) attendant upon dissolving the nitrate in "salted" water. There is then left a solution of nitrate of silver with a nitrate or nitrates of the base or bases present; and as we write there does not occur to us a single case—at anyrate, in wet collodion—where their presence would be in the slightest degree injurious; and, of course, it is always open to the photographer, where pure distilled water is indispensable, to obtain it from some undoubted source. The next point that arises is the abstraction of the organic matter where it does exist, which, fortunately, within certain bounds, is not a difficult task. We pointed out in our *Scientific Jottings*, a little while ago, the extraordinary property possessed by the silicated carbon filters of abstracting organic matter, even such as the poisonous alkaloids, from water, the only possible objection to them, apart from their very slight expense, being the presence of iron in the filtering medium. Iron, however, possesses the remarkable property of withdrawing organic matter from solution—an effect which can any time be easily seen by placing a coil of clean iron wire in a vessel of water, a flocculent deposit containing iron and the organic matter almost immediately being visible around the wire. Founded on this principle is Bischoff's spongy iron filter; but the risk here of iron contamination would be still greater.

Charcoal itself, however—animal or vegetable—possesses this power in an eminent degree. It was the perusal of a paper, read before the Manchester Literary and Philosophical Society, which led up to the present train of thought here presented. This paper gives an account of the remarkable oxidising action of animal charcoal on certain organic matters. This oxidation may result in the removal, or the converting into less harmful forms, of the various organic matters contained in the samples investigated. The charcoal employed was of a peculiar nature, and, after admixture with a large heap of nightsoil, it so purified it that the effluent water was colourless and odourless, but of saline taste. The effect of charcoal has long been known, and the wood and the animal charcoal have been supposed to have different effects—the former answering better forab sorbing gases, and the latter for colour.

It is not a difficult matter to provide a supply of each of these materials at a very small cost, and then a little boiling in weak acid water, and well washing afterwards, will purify it so as to be useful for almost every purpose. An arrangement for a permanent filter might readily be devised, at a very slight cost, by anyone even slightly conversant with joinery or carpentry; and when once put in order it would last for a long time without any attention.

We may conclude by saying that water so produced would be superior to a very large proportion of the distilled water we can *usually* buy in the shops, and for most practical purposes it would be a perfect substitute for pure distilled water.

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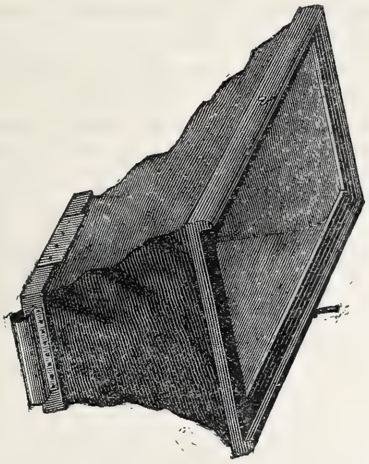
THE SCENOGRAPH.

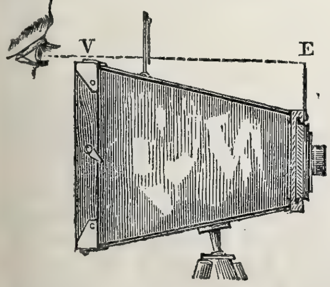
We now fulfil a promise made several months ago to give a descriptive article on the scenograph.

One whose ideas of cameras and photographic apparatus have been acquired from an acquaintance with the works of English camera makers will, upon examining a scenograph, immediately assert that it is a mere toy and nothing more. Taking the admirable and high-class work of our home makers of apparatus as a standard of comparison a toy the scenograph is, most assuredly, *but* it is a toy by means of which good pictures may be taken. Although it outrages all our ideas of mechanical propriety by its simplicity and the rough-and-ready way in which means are adapted to an end, yet from this very simplicity it may be possible for us to learn something that, when modified, may prove highly beneficial.

The scenograph is of continental origin, everything connected with it betokening its French conception and production. It is a portable camera which, when opened out, assumes a conical or wedge-like form. It has a cloth body; indeed we may very fairly describe it as being composed of two light frames—one for holding the lens, and the other in which to place the focussing-screen and dark slide, these frames being connected by means of the cloth body. Hence it may be made exceedingly portable. When "shaken out" and ready for the insertion of the bars by which it is kept firmly distended it assumes the form shown in the accompanying figure.

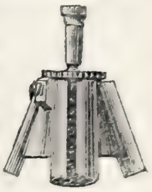


It is scarcely necessary to observe that the flexible body of the scenograph is composed of a fabric which is quite proof against the transmission of light. Rigidity is imparted to the camera by two slips of wood—one above and the other below; and it is quite wonderful what an amount of rigidity is thus conferred. In the specimen which we have had an opportunity of examining the camera, after the insertion of the flat struts, becomes almost as rigid as if it were constructed altogether of solid wood. This fact ought not to be lost sight of by those who aim at constructing portable cameras, cones, or photographic appliances of a similar description.

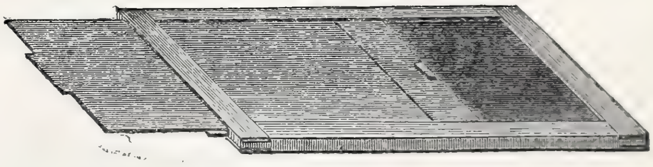


In the adjoining diagram we show the camera when distended and mounted upon its stand ready for use. There are guiding wires erected on the upper distending strut at V and E, along which the eye glances in order to ascertain that the camera is properly levelled or directed at any desired object. This, we think, is quite unnecessary, as it is preferable to ascertain and arrange the composition of a view by an examination of the image upon the ground focussing-glass of the camera. But as these sighting wires can, in half-a-minute, be entirely removed by a twist with a pair of pincers, we need not here find fault with them.

The tripod stand of the scenograph is quite an "institution." It forms, when packed up, a simple bamboo walking-stick of very unpretending appearance. Inside of this there are two brass rods, one within the other, and these three, when "unlimbered," are inserted each into one of three sockets forming the tripod top, which terminates in a ball-and-socket joint, to which the camera is attached. This stand is both simple and rigid, as will be seen from the annexed diagram. The only fault that we have to find with this stand is its want of sufficient height. If it were about eighteen inches higher its efficiency would be greatly increased. Of course there are many subjects in which a greater altitude in the point of observation is not required, and in which a three-feet stand would answer quite as well as one six feet high; but it is at all times well to possess the power of placing the camera on an elevated standpoint, even although one may not at all times choose to make use of this power.



The dark slide deserves more than a passing notice. It is solid, being composed of one piece, and yet double, being capable of containing two sensitive plates, and is the leading feature in this wonderfully-simple instrument. We were at first slightly at a loss as to what to compare this double dark slide. The frame of a schoolboy's slate presents itself as an object to aid us by way of comparison, and yet it quite fails in this character. The only way by which to convey an adequate idea of this piece of mechanism will be to dissect it. Let us suppose, therefore, a strip of mahogany half-an-inch in thickness, and somewhat less than that in width. Let us now suppose that three narrow saw-cuts have been run longitudinally across one face of this strip, and we have the material out of which the dark slides are made. This strip is cut into pieces of convenient length, which are glued together at the corners, and additionally fastened by brass corner-pieces. In the centre groove is inserted a black and opaque piece of thin card, and in the grooves near the edge is made to slide a shutter composed of a kind of brown cardboard of the thickness of a threepenny piece, but of the smoothness and hardness of a piece of polished veneer. Cardboard of such toughness and texture appears quite unknown to London paper warehousemen, judging from the result of inquiries we have made. Between this cardboard shutter and the opaque partition there is quite room enough to place a plate at such a distance from the shutter as to be free from all danger of its being touched on the surface. A small bit of wood glued on the face of the sliding shutter renders it impossible to be quite withdrawn from the dark slide. The following diagram conveys an excellent idea of the appearance of this simple yet effective slide :—



A notice of the scenograph would be incomplete if we did not allude to the method by which stereoscopic pictures are taken by its means. From the diagrams it will have been seen that the scenograph is of a conical form. The lens is attached to a sliding front, which moves in a horizontal direction. This front slides so far from side to side as to bring the lens directly opposite the centre of each half of the plate, supposing the plate (one of about six and a-half inches in length) to be visually bisected by means of a partition inserted to divide the camera into two portions. But as this necessitates an oblong aperture as large as the lens being cut diagonally in the solid front of the camera, it is evident that when the sliding front is pushed to one side the light would be admitted through the opposite end of the aperture, now left uncovered. To obviate this a band of black flexible leather, the full width of the sliding front, is firmly attached to each end of this front, the opposite ends being also firmly connected with the respective sides of the solid frame. The length of these pieces of leather is so regulated as to allow the lens to be moved to one side a certain distance and no farther, and in this way is arranged the horizontal motion of the lens when employed in taking a stereoscopic picture. Not only so, but the act of sliding the front to one side draws the leather band close over the otherwise open end of the oblong aperture and effectually seals it against the transmission of the feeblest ray of light.

In our last volume we bore testimony to the excellence of the pictures obtained by Mr. W. B. Woodbury, the importer of the scenograph, during a tour on the continent; and we have only further to say that the clever manual devoted by Mr. Woodbury to this piece of apparatus is illustrated by a picture thus taken.

When alluding on a previous occasion to Mr. Vanderweyde's new method of taking photographs by artificial light by the agency of a cata-dioptric apparatus, we stated that we had not seen any specimens produced by means of this mode of lighting. We are now more desirably situated in this respect, for we have before us a number of prints obtained by artificial light directed upon the sitter by the method in question. This method, we may remind our readers, consists in the flame of an intense light, such as the electric light, being projected against the interior of a parabolic reflector, the open end of which is capped, so to speak, by a large Fresnel lens. This lens is presumably of the kind designated by Sir David Brewster, in his *Optics*, as "polyzonal," and is, perhaps, better known as being that now employed in dioptric lighthouse systems for projecting forward a large beam of light which, according to the position of the light, may be either parallel or convergent. It is when used in this latter way that its services are now utilised in photography. By its means the whole of the light (subject to only a slight percentage of loss by absorption) emanating from the carbon points of the electric light is condensed upon the sitter—not, however, in the form of rays refracted directly from the radiant, but rather in the form of a luminous cone, the base of which is like a white cloud. This is effected by interposing an opaque screen between the light and the condensing lens, the whole of the rays being projected, as we have said, into the large reflector, which throws them forward in a parallel direction through the refracting lens. In the conical column of light thus projected into space is placed the sitter. Such is the actinic power of this cone of light that, when using an electric light of medium intensity, excellent portraits can be obtained by an exposure of less than thirty seconds. With a more powerful light and a more rapid-acting portrait lens we see no reason why the exposure may not be reduced to a few seconds. Portraits taken by artificial light, such as the bare electric or magnesium flames, possess a singular crudeness and hardness, the inseparable consequence of the light coming from a point; and this cannot be overcome by any amount of reflection. It is to this cause may be traced the failure of various ingenious schemes—some of them the subjects of patents—which have from time to time been introduced with a view of solving the attractive problem of nocturnal photography. With regard to the quality of the specimens produced by Mr. Vanderweyde's new method: they are exceedingly soft and delicate, possessing great transparency in the shadows, with perfect opacity in the high lights. One specimen possesses the special quality usually obtained by highly-artistic retouching, to which we imagined the effect was due; but upon examining the negative from which the print had been produced we found that it was absolutely untouched. We are glad to find that a satisfactory solution of the problem has at last been found. For a considerable time past we have been aware that Mr. Vanderweyde was experimenting in this direction, and that during his experiments he had been led to modify his previous ideas; and it is satisfactory to know that photographic portraits of the highest class may now be taken *sans* daylight.

We are not sure that we comprehend Mr. Johnston's meaning in his paper at page 139, and only now allude to it in consequence of the suggestion shadowed forth in the last paragraph but one. This is a method by which Mr. Johnston hopes, to use his own language, "to separate the soluble and unnecessary salts which are the products of the formation of silver bromide from the bromide of silver without the necessity of having to wash the emulsion." This is, surely, an important question, and Mr. Johnston's idea consists in forming the bromide in suspension in some liquid, "organic or inorganic," and, after allowing a due time for its deposition, to pour off the supernatant liquor, leaving the bromide in a pure state ready for re-emulsification. Possibly Mr. Johnston's settlement of question of the functions of organic matter in the presence of silver bromide may make the *rationale* of this method clear and practicable to his mind; but for ourselves, having different views of those functions, we are inclined to look upon the proposal with considerable doubt. It seems to us that the generally-accepted theory of the function of organic matter—and we see no reason yet for departing from that belief—is that it forms, with the salts of silver, a soluble compound, which plays a most important part in the formation of images upon the sensitive film; and it also appears that this compound would be removed simultaneously with the "soluble and unnecessary salts" of which the writer speaks, unless, indeed, by some process of natural selection the one can be removed without the other. Curiously enough we have in our possession a preparation which enabled us in advance to put to the test the value of silver bromide in what Mr. Johnston elects to term the "neutral state." Some months ago we received from that gentleman a sample of emulsion prepared by his new method, and which at the time, while quite new, worked extremely well; but, alas! as time wore on it became gradually thinner and thinner, from the action of free ammonia upon the collodion, until it was quite incapable of retaining the bromide in suspension for more than a few minutes, though the latter remained in an extremely fine state of division. Noting this fact we allowed the bromide to subside, and poured off the perfectly clear solution, replacing it by an equal quantity of plain collodion, with which it re-emulsified perfectly. A trial plate, prepared and developed at the time, gave a sufficiently favourable result; but subsequent plates have amply demonstrated the correctness of the term applied by Mr. Johnston, as they are absolutely unacted upon by the developer—a description of neutrality scarcely to be desired. Whether this effect is to be traced to the action of the ammonia salt used in sensitising we cannot say; but the result appears to us to be eminently unfavourable to the employment of ammonia for the purpose of inducing a "state of neutrality" between the organic matter and the molecules of silver bromide, as suggested in the paper referred to.

RAPID COLLODION EMULSION PROCESS.

The "Peripatetic Photographer" has asked me for the formula of the rapid collodion emulsion I have lately made; this I am now enabled to give through the kindness of Captain Abney, from whom I obtained the formula.

I do not know that Captain Abney lays any special claim to originality in his method, though, so far as I am aware, he was the first to add albumen to the collodion before sensitising. Colonel Stuart Wortley, a year ago, recommended gelatine to be so added; Captain Abney prefers albumen. We have to thank Mr. Warnerke for pointing out the properties of zinc bromide.

In the first place, it will be necessary to obtain a good ordinary pyroxyline. I have used Thomas's. This, luckily, will not be a difficult matter. Captain Abney's formula stands thus:—

Pyroxyline (ordinary)	8	grains.
Zinc bromide	10	,,
Nitric acid	7	drops.
Albumen (dried)	½	grain.
Ether Alcohol	*quant. suff.*	

My method of adding albumen differs in detail from that of Captain Abney, who stirs the dissolved albumen gradually into the collodion. While this method answers well in his hands, I have found the following more simple and much more easy of accomplishment:—

Place the pyroxyline in a bottle capable of holding three or four volumes more of emulsion than you are about to prepare (I find a sample hock bottle suitable for preparing five ounces of emulsion). It is not necessary to use the full quantity of solvents, but I have found twelve drachms of absolute methylated ether, and the same of methylated alcohol, sp. gr. ·823, necessary to effect the solution of forty grains of the pyroxyline. Pour the ether into the bottle, and then the albumen dissolved in water, or three or four minims of natural albumen may be used instead to every eight grains of pyroxyline; shake well, and add the alcohol gradually at first, shaking between each addition. The collodion will now appear much like a solution of gelatine; there should be no clots of albumen. If the zinc bromide be not added in the solid state—and for several reasons it is best dissolved—the bromide solution must be substituted for the whole, or part, of the twelve drachms already mentioned.

It will be well to ascertain how much silver nitrate a certain fluid measure of this bromide solution will decompose. The ten grains of bromide should convert about fifteen grains of silver nitrate; to this must be added two grains of silver nitrate in excess.

When preparing the above quantity of emulsion I dissolve the silver in one drachm of water, and at the same time heat one ounce of the methylated alcohol, to which I add, just before pouring it into the dissolved silver, the necessary quantity of nitric acid. The silver is now added by degrees to the collodion with shaking.

The emulsion can be kept "according to taste," as the cookery books say. I think at a temperature of 60° Fah., forty-eight hours will be found a suitable time. I have not yet found any gain in sensitiveness if the emulsion be kept longer, but plenty of fog. This may be cured by the addition of a little solution of iodine after washing.

Before pouring out to set I prefer to add ten minims of glycerine to every eight grains of pyroxyline. Allow the emulsion to evaporate until quite firm, when it should be about one-eighth of an inch thick. For the above quantity use a 10 × 8 dish.

I think it best not to detach the pellicle from the dish, but to pour the water—which it will be well to acidify at first with sulphuric acid—on the surface, changing it at first every five minutes. Captain Abney prefers to discontinue the washing when only a trace of silver nitrate can be detected in the water on adding hydrochloric acid. It seems to me that this plan will probably render necessary the addition of iodine, or its equivalent, to the emulsion, and certainly a second batch of emulsion to which I added iodine solution to correct fog is now in a state very much like that prepared with the organic pyroxylines—it splits up on drying, and sometimes the effect is quite startling, a mere touch sufficing to make the film fly into ribbons. I prefer to wash thoroughly and get rid of the zinc nitrate, more than a trace of which would otherwise remain. When the washing is judged to be sufficient break up the pellicle, and place it in a clean cloth, roll up, and force all the water possible out of it. It will be well to test this water for free silver. The pellicle is now broken up, and dried at a gentle heat. I dissolve the pellicle in equal parts of absolute methylated ether and alcohol. If the smell of the alcohol be objected to, rectified may be substituted at extra cost. The methylated spirit is at least good enough for making the emulsion.

I sometimes find a difficulty in keeping the film on the plate when using only an edging of india-rubber. This answers well enough with the Liverpool emulsion, and, judging from the character of the Company's pellicle, the pyroxyline employed is very suitable to washed emulsion.

Captain Abney considers the emulsion rather lacking in density-giving qualities, even when the emulsion is only kept twenty-four hours before washing. This is not my experience with emulsion kept for a longer time. I have used for a quarter-plate one grain of pyro. in two dachms of water. I pour this over the film, previously wetted with spirit, when the image appears with considerable vigour. I then add ten drops of a ten-grain solution of bromide of potassium and four drops of a 1:8 solution of ammonia (sp. gr. ·880). This developer will give ample density—very easily too much density. I believe this emulsion may be considered six times as sensitive as the ordinary pellicle of the Liverpool Company. I do not say this to disparage the really very excellent emulsion prepared by that Company; I merely mention it because its working is well known to many of your readers.

I send you two negatives—one made with the Liverpool emulsion, the other with the zinc emulsion made as described. The lens used was a compound stereo., stop $\frac{f}{16}$; the subject was brilliantly lighted, with dark shadows. The exposure given to the Liverpool plates was seven and a-half minutes, and the development that given in the instructions. The "Abney" plate received one and a-quarter minute's exposure—that is, one-sixth part of the other—and was developed as I have described. You will see that there is equal detail in both plates; but it will be necessary to hold the "Abney" plate over a sheet of white paper in order to see that in the shadows the negative is a little weak; this was caused by leaving off the development too soon, as I was afraid of getting the negative too hard. The negatives were taken in a roaring March wind, so you must make allowance for the "fuzziness" apparent in both of them. The greater part of the subject was perfectly still.

HERBERT B. BERKELEY.

P.S.—*Acid v. Alkaline Development.*—I have exposed two more of the "Abney" plates today, together with two zinc gelatine plates (the nature of which I shall describe in another communication). One gelatine plate was exposed half-a-minute, the collodion plates one minute, and the other gelatine plate two minutes; the same lens and stop as before. The gelatine plates and one of the collodion plates were developed with the same alkaline developer, and the other collodion plate with the acid silver developer, I have been surprised to find that the detail in the collodion plates is equal. Of course the development by the alkaline method was much more rapid than by the acid development; but patience brought about the same result. It is probable that a much more powerful alkaline development might show a great advantage in its favour; but this experience shows the great rapidity of the emulsion, even if worked with the acid developer. I had reason to believe that this would be the result, because I had noticed that the alkaline developer did not always appear to add much to the detail of the plate, but rather to the density. The gelatine plates (of which I had exposed duplicates) would not admit of the acid development, as the water used with them contained sulphate of magnesia, which decomposed the silver nitrate, forming silver sulphate. The plate exposed half-a-minute has less detail than the collodion plates, and the plate exposed two minutes has somewhat more detail. I should think that with the developer used they were about equally sensitive. The gelatine plates are the more vigorous. I am sorry that the collodion plates are rather thin, but there is no necessity that they should be so; a little more forcing would have brought them up easily. I send these plates, also, for you to see, as well as others who may be interested. The developer stain has been avoided in the gelatine plates. The collodion films will be seen to be of rather a contractile nature. They left the plates during the washing; hence the bare edges of the plates.—H. B. B.

STUDIES UPON THE ACTINIC POWER OF VARIOUS COLOURS, AND UPON THE PRODUCTION OF PAPER FOR BANK NOTES AND OTHER PAPERS OF VALUE, IN COLOURS THAT SHALL DEFY IMITATION BY PHOTOGRAPHY.

[A communication to the Photographic Society of Vienna.]

SOME time ago I was requested to make public my experience with regard to the actinic power of various colours, especially of those used for the production of papers of value, paper money, &c., with the view of protecting the latter from imitation by means of photography. My experience was, however, bounded by those colours which came in my way as a practical photographer. But the subject called for a more thorough investigation—the more so as, to my great astonishment, a high official of the National Bank here had told me that the French blue bank notes, which were supposed to be unphotographable, had already been imitated by means of photography.

I prepared for myself a colour chart showing most of the common colours in great purity, and with their principal gradations. This table was very well suited to my purpose, since in the centre of each colour there was a letter left of the original white paper, which offered a convenient point of comparison upon the negative for the degree of whiteness of the paper with that given by each of the colours printed upon it. I took negatives of this colour chart with various degrees of exposure.

Even the most actinic, though unstable, violet showed a very distinct difference between itself and white, and so did cobalt blue, which was used for printing the bank notes mentioned above. The contrast between the remaining colours was greater, so that they lost all interest for us in treating this special subject. From the foregoing facts I drew a conclusion as to the process apparently employed in making these forgeries.

There can be no doubt that if anyone has succeeded in producing an imitation of a note printed in cobalt blue by photographic means he must have employed a very roundabout process. He necessarily required printing plates producible by photography. Given, then, a drawing in blue upon a white ground: a picture taken from it would be far too weak to serve directly for the production of a plate for any sort of print. Here a circumstance, regarded by the ordinary photographer as a disadvantage, is to all appearance taken advantage of, namely, the circumstance that a transparency produced in the camera of a portrait or other picture in half-tones is generally harder and flatter than the original negative, and that a negative also produced in the camera from this positive is, in turn, harder and flatter than the positive.

Let us, then, suppose the power of the precipitate upon our colour negative to be divided into degrees, such as those given by Dr. Vogel's photometric scale, and let us call the difference between cobalt blue and white 2°; then the difference between them in the positive produced in the camera might easily be increased to 4°; that in the negative made from this positive to 8°, the next to 16°, and in this way the originally weak picture could be strengthened, so that the negative finally obtained should be sufficiently coloured to be used for the production of a printing plate for which a precipitate of 20° of density would suffice. The exposure must be diminished each time, so that the precipitate, which the blue at first gave rise to upon the negative, became always less.

The method of multiplying negatives described by Obernetter may also have been used; in which case it must have been repeated several times, the exposure being shortened each time, and the dusting-on continued, if possible, until the necessary contrast had been obtained.

Thus the blue prints, so celebrated at one time, do not afford the state the desired protection against the apparently harmless guild of photographers, amongst whom they scent their most dangerous enemies. In order to free the nation from this distrust of photographers, and the latter from the burden which oppresses them, it is very desirable that the lichtdruck artists and the finance minister and bankers should agree to some method by which all possibility of reproduction would be cut off. The continuation of my investigations of colour have carried me to results from which I believe that I have found the desired means.

I thought first of sulphate of quinine; that is, of impregnating the paper before printing with a solution. This precaution ought to be a protection against reproduction, since the writing, invisible to the naked eye, is very distinctly visible on the negative; but sulphate of quinine soon becomes yellow, and the writing done with it very shortly becomes visible, and easily imitated graphically. Further reflection led me to try, as no colour proved an exact photographic equivalent for white, whether there was any one that would appear light to our eyes, yet be as unactinic in its action as black; that is, I thought of printing the entire surface of the paper with this unactinic colour, and upon the tint printing the device and text in black. I then took my colour chart and partially painted over the yellow, green, and red squares with black china ink, and took several photographs of it with exposures of different lengths.

The contrast was distinctly shown between the black and the vermilion, orange, and metallic green, but with the bright chrome yellow it was infinitesimally small. My joy over this result was of short duration, however, only lasting until I remembered that Dr. Vogel had recommended the addition of coralline and aniline green to the collodion to render it sensitive to the red and yellow rays. By means of these and other additions, such as the use of coloured glass, it was apparent that a stronger contrast was obtainable, and that by manipulating it in the way described as applicable to cobalt blue a printing plate may be prepared photographically from it also. The result was that I failed to combine various colours so as to defy photographic reproduction.

Since that time I have begun to use lithography and lichtdruck in colours for business purposes, and have taken advantage of the opportunity to print flat tints of various shades and drawings upon these, and in this way I have, at length, reached the desired result of printing certain colours upon certain others, so that they cannot, by any means, be photographically reproduced.

I got a series of such combinations, of which I shall only mention three, namely, cobalt blue upon clear yellow, dark blue upon green, and cinabar (vermilion) upon chrome yellow. These defy all the powers of the photographer, even when employing additions to the collodion, coloured glass, &c., because the underlying colour, though scarcely visible to the eye, shone through the superimposed colour, so that the latter must be several degrees more actinic than the former.

From the foregoing it will be seen that papers of value may be produced which cannot be photographed, the writing and drawing being printed from flat, sunk, or relief plates on the well-dried coloured under-print.

I also tried to reach my end by another process. Experience had convinced me that cobalt blue prints, consisting—like the bank notes mentioned at the beginning—of lines and spaces, offered no insuperable difficulties to its photographic reproduction; but it is quite different when the cobalt blue pictures are printed in half-tones. In this latter case they are as little capable of being photographed as the combination of colours spoken of above.

Thus, let a relief, containing characteristic heads and ornaments, be prepared by an artist; coat this design with gypsum (and a little brick red) as often as one wishes to have notes of the same value on the same printing plate. Now arrange these casts, of which there are (say) four—two alongside of each other and the other two above them; now photograph them in a sharp side light and from the photograph print them by lichdruck or heliography. I have prepared such a relief for myself from a galvanoplastic impression, and printed it by lichtdruck in cobalt blue with all the half-tones.

To that the objection may be raised that as yet lichtdruck and heliography do not furnish such fine half-tones as would be required by such delicate work as the manufacture of papers of value. But, while waiting the greater perfection and exactitude of the photographic method of printing, there is an excellent substitute in a method which has been known for hundreds of years, but is little used now. Let the pictorial design be furnished on a burnished copper plate. From the latter as many reproductions as are desired can be produced, galvanoplastically, exactly true to the original, and having quite the appearance of perfectly successful heliographs from nature.

These two methods can be very well combined upon one and the same paper. There remains only for me to mention that, as practical men have assured me, my methods serve as a protection against anastatic as well as graphic imitations, and that the possibility of having characteristics recognisable by everyone gives my methods an advantage over many other projects. MAX JAFFÉ.

◆

THE GELATINE PROCESS.

I HAVE lately found time to prepare two batches of plates, by the gelatine process, which have given me such good results that I think some of your readers may be tempted to verify my experiments, or, at least, the later of them.

I used my old formula, or rather that of "Amateur," which I may state shortly as consisting of—

Gelatine	40 grains.
Bromide of potassium	40 „
Nitrate of silver	55 „
Water	2½ ounces.

My first batch, with three and a-half hours' dialysing, gave me negatives beautifully full of detail; but, owing to an oversight in the dialysing, there was a little crystallisation visible in the thickened edges. I gave fairly full exposures, and used bromide to restrain the development. The negatives did not quite please me, as they were thin and flat; moreover, there were circular spots which, on development, became bare glass, and which were due either to bubbles or globules of fatty matter that spoilt some of the negatives.

As I used no distilled water I knew that my proportion of silver was under the equivalent; so in my second experiment I threw down the chloride in the water with which I mixed the silver solution before adding my fifty-five grains of silver salt, and to make all safe added about one and a-half grain of silver nitrate—fifty-six and a-half in all. The result surprised me. Dialysis for four hours gave a clean plate; and an exposure as nearly instantaneous as I could make it, without a special shutter, gave me a brilliant negative with plenty of detail and capable of being worked up to opacity by the alkaline method.

I used the following developer, which is a modification of Mr. M. Carey Lea's:—Pyro., sixty grains to one ounce of water; *liq. ammon. fortior*, one drachm to twelve drachms of water. I added twenty minims of each of these solutions to an ounce of water, and poured at once on the plate without previous wetting. I used no bromide.

The first few instantaneous negatives I did not force beyond a comparatively feeble stage, though they were very bright and vigorous, and I was much disgusted at finding them disfigured with hazy spots, each with a small gritty nucleus, which I put down to particles of lime, the room in which I prepared the plates having been recently whitewashed and being very dusty. The next four I exposed for periods varying from five to eight seconds, according to the size of stop used, and three of these I brought up to an unmanageable pitch of density without fog or halation; the objectionable spots, however, appeared as before. I then resolved to try how silver intensification would act with pictures of both batches. It was quite successful, the feeblest negatives of the first batch being brought up to more than proper density without difficulty, and the spotted negatives of the second being not only properly strengthened but rendered perfectly clear, haze and nucleus alike disappearing. This was a confirmation of my theory. But, to be quite sure, I took one of the four negatives which did not require intensification but was spotted, and, after treating it with diluted glacial acid of the same strength as the solution used for intensification, successfully eliminated the spots.

These experiments tend to confirm me in an opinion I have long held—that it is to development we must look for all improvement in dry-plate work, such as it is at present. I find that with the simplest materials it is possible to obtain rapidity, clearness, and density combined; and the only variation in my manipulation that I can indicate is the omission of bromide from the developer, and, possibly, the exposure of the emulsion for some hours before dialysis to the action of a slight excess of silver nitrate. I am disposed to think that very small variations in the proportions of the materials employed in emulsions may lead to very important modifications in results; but that by carefully adapting the proportions of alkali, pyrogallol, and bromide in the developer, nearly every gelatine plate may be made to produce a good negative.

Silver intensification—which I have always hitherto viewed with suspicion—is a great power, and will, I am sure, often prove the salvation of a batch of exquisitely-sensitive plates which sulk under alkaline development, if resorted to in time. I am so satisfied with it that I shall scruple to press a reluctant plate with ammonia in future, and shall trust to acid silver to save all doubtful negatives.

I have read with great interest Lieut. Lysaght's remarks on developing gelatine films, and the editorial articles which they have elicited. I was working in the same direction last summer, with a moist temperature of about 93°. I tried a bath of gallic acid to toughen the film, which retarded development, but eventually a dense picture was produced. When the film was dry it appeared as if all organic matter had been dissolved. A very tender film or layer of metallic silver formed the images, which could be burnished where the light had acted strongly, but was so delicate elsewhere as to be useless for printing purposes. I tried a solution of tannin and pyro. as a coat before development for some of the first batch of this year's plates; but it was a total failure, the plates blistering and staining in a most obnoxious way. Ordinarily speaking I never have a blister or a trace of frilling, and I believe that the reason is that the water I use is very hard and rich in chlorides, though I cannot assign any reason for their reaction on gelatine. I do not think the process suitable for a tropical climate in the hot weather or rains, and fear that any attempt to work it there must end in failure. In moderate temperatures and for large plates gelatine should, I think, hold its own against collodion. J. King, M.A.,

Bombay C. S.

ORGANIC AND INORGANIC MATTER: THEIR USE IN BROMIDE OF SILVER EMULSIONS.

[A communication to the Glasgow Photographic Association.]

To have organic matter in conjunction with bromide of silver, so that it may act as a vehicle for distributing it equally over a suitable surface, is a necessity in emulsion work. The other function, or functions, which it performs not being so apparent as the one already alluded to, the question has been, on that account, often raised as to what action organic and, likewise, inorganic matter have on bromide of silver to produce the real or fancied changes attributed to them.

I have always looked upon the solution of the above question as the key to the successful preparation of bromide of silver emulsions, and have, in consequence, given my attention to it for a considerable time. The conclusion that I have come to is that the property of affinity possessed by the bromide of silver enables its molecules to combine with the molecules of organic and inorganic matter, which possess a similar property of affinity, and in such a degree the combined molecules just neutralise the affinity of each other, the result being that a molecule of bromide of silver with its equivalent of matter, either organic, inorganic, or both, remains in a neutral state as regards its affinity for another molecule of bromide of silver. This conclusion has been arrived at by observing the formation of bromide of silver and certain peculiarities connected with it after its formation.

I now propose to show the nature of my reasoning, and for that purpose will assume a case of the formation of bromide of silver in water. I have selected water, as in it the peculiarities of the affinity possessed by bromide of silver appear in a very decided form.

On adding silver nitrate in solution to a soluble bromide in solution a substance is formed of a pale yellow colour, which, I need scarcely add, is bromide of silver. At the instant of its formation it presents a fine creamy appearance, after which it is seen in a perceptibly granular state, being deposited on the side and bottom of the vessel in which it is contained, and in this condition is unfit for photographic purposes. I have no doubt that these features in the formation of bromide of silver are too often unpleasantly familiar to those engaged in emulsion work. However, I have found them very servicable in pointing out the means to an end.

The creaminess first observed is always a sign of the silver bromide being in a fine state of division; the granular state which succeeds it is undoubtedly caused by the affinity which the molecules of bromide of silver have for each other. I have thought it necessary to assert this, as much depends upon the fact.

If some of the deposited bromide of silver be examined closely it will be seen to be composed of separate particles, all of which appear to be about the same size, and they, apparently, have no further tendency to increase in size or join with each other; they appear to be in a neutral state, as if some condition of affinity had been satisfied.

Now, instead of a very great number of molecules of bromide of silver being required to join together to produce a state of neutrality in the particle which they compose only two were required; it is evident that bromide of silver in a fine state of division would be the result. But this cannot be done, and even if it could it is very doubtful if pure bromide of silver in a fine state of division would be photographically more serviceable than it is in the granular state. Here, then, it is where organic or inorganic matter comes to our aid.

In experimenting with ammonia and bromide of silver combined, and subjected to heat, I have been able to increase the affinity of the silver bromide; and, on the other hand, by adding acetate of ammonia and gelatine to silver bromide and applying heat I have caused the silver bromide to assume a fine state of division. From these and many other experiments I found that ammonia is a suitable agent for bringing organic matter in conjunction with the molecules of bromide of silver to produce a state of neutrality in them. The action of suitable organic matter on ammonia would appear to be to reduce its affinity to a degree to just produce neutrality in the bromide of silver molecules.

I will show you a sample of bromide of silver in a neutral condition. This bottle contained bromide of silver suspended in the liquid which is now in it, but, being undisturbed for a period of three months, the whole of the bromide of silver has been precipitated. My object in having it in this condition is for the purpose of solving a rather important problem in emulsion photography, which is to separate the soluble and unnecessary salts—which are the products of the formation of silver bromide—from the bromide of silver, without the necessity of having to wash the emulsion.

The experiment will, therefore, answer the double purpose. I hope at the next meeting of the Association to have time to show bromide of silver in the condition already referred to.

J. Johnston.

ON THINGS IN GENERAL.

Mr. Norman Macbeth, A.R.S.A., read a paper before the Edinburgh Photographic Society containing much excellent practical advice, evincing, as might be expected, a thorough acquaintance with the theoretical principles of that art of which he is a master. He pointed out in well-chosen words the artistic excellences and pictorial shortcomings of Mr. Kareline's works in language which could not fail to instruct. He praised Mr. Kareline's knowledge of composition, and noted the skilfulness of his *chiaroscuro;* he held up for admiration his dexterity in lighting and the effects he obtained. Design, pictorial quality, and general culture Mr. Macbeth recognised with pleasure in Mr. Kareline's works; and yet, while rejecting the prejudice of artists against photographers, he was evidently so anxious not to render himself a *mauvais sujet* that he was perpetually fencing and hedging in himself and his art with a series of barriers of a most artificial nature. His composition was wanting in logical sequence, and his teaching was deprived of half its value from the opposing character of some of its assertions.

To apply the canons of art criticism to a photograph of surpassing beauty, and then to deny it a place among the fine arts, is, to use a mild form of expression, inconsistent. "Photography has no aim beyond realisation." Then what is the meaning of "culture?" and why accord praise to "breadth of composition" and "aërial perspective?" Again: Mr. Macbeth indissolubly connects correct drawing with skilful painting; but is it not a fact that some of the greatest painters have been most ignorant of correct drawing? And, when he speaks of "fineness" being "vulgar," I would ask to be allowed to remind him of Meissonier, who, in a panel the size of one's hand, will paint half-a-dozen figures with every face a masterpiece of expression, and where utter fineness is allied with perfect breadth of treatment and nobility of aim. No; it is the truth that photography must and will take its place among the fine arts, limited in scope and deficient in capability of facial expression, but none the less a fine art, where æsthetic perceptions and cultivated taste may find a field for the production of pictures which should please and elevate. A painter does not gain his artistic spurs by taking in hand his palette and brushes, nor a sculptor by his chisel and mallet; othewise a sign painter or a carver of death's head and crossbones on a rural tombstone would properly speak of their fellow-artists of the academy. So with photography; it is not every man who spends a ten-pound note in a lens and box that is an artist or whose photographs are pictures.

I am half inclined to think that it was this want of consistency in the paper in question that led to the discussion following it taking the usual turn, as it did on that occasion, of discovering the "secret" of such fine works—Mr. Macbeth himself setting the ball rolling by saying that he believed "the mystery of his method lies more in chemistry, and by a process of development." This little speech gradually became surrounded by the usual attempts to "explain" how it is done, always escaping the one wonderful ingredient rendered famous by Opie—brains. Who does not remember Adam-Salomon's pictures? How they were peeled and scraped and boiled like so many potatoes to discover his secret, till at last a guaranteed formula for his process might be had; and yet how few have ever equalled him! Did his chisel make him an artist? If it be the inner man and not the external symbols of his profession that stamps his work, is it not very foolish to deny it to those of his works executed in the limited field of photography? Here is an artist of the recognised stamp, and an incident that happened with in my own cognisance:—Oh! Mr. Connoisseur! will you drop in and have a look at my picture of the mayor before I send it home?" Mr. C. calls in. "Well, now, what do you think of it?" "Well, I should know it again." "But isn't it a first-rate painting? Of course it is, and yet look at the difference between my prices and Mahlstick's, in Regent-street! I use the same brushes, I buy my colours at the same place, and this very picture has had six coats of body colour, and here I am in an attic," and so on. Is not this the *reductio ad absurdum?*

The mention of colours and brushes brings to one's mind Messrs. Rowney's letter of a week or two ago, wherein they very properly show up the ignorance of a consumer of their materials, who, from the depths of his ignorance, had elaborated a complaint against a firm of acknowledged and well-known standing.

I propose that, as a reward, we adjudicate with acclamation the first medal for progress to this firm. But, all jesting aside, I am of opinion that such a medal as that recently proposed, might well be instituted with great advantage, and to none would I more gladly award it than to Mr. Woodbury himself, whom I consider to be a prince of experimentalists. To say that the acceptance of Her Majesty's seal royal on the back of a bit of parchment, with its concomitant advantages of a commercial character, is his reward, is about as satisfactory as to be told that virtue is its own reward. Virtue likes to have its back patted.

We must draw the green curtain down at last over the comedy of the violet curtains. M. Scotellari's light has been pronounced decisively, by the French commission appointed to report upon it, of no use whatever—rather a detriment than otherwise. I never expected anything else, for the Editors hit the nail exactly on the head when they alluded to the "part being less than the whole."

I wish the Editors would take the hint dropped at the Glasgow meeting, remembering that the whole of the series, of which each volume of The British Journal of Photography is but a part, would be rendered complete by a general index. I hereby willingly offer to subscribe for a copy.

I was much interested to note in Professor Stebbing's letter the account of the discussion as to the advisability of forming a sort of permanent commission to try the validity of all alleged new processes. I am inclined to think there is more to be said in favour of the idea than against it. Doubtless there is considerable weight in M. Despaquis' objection; but as, in all probability, letter and book would be quoted in the judgments given, there would be little fear of a miscarriage of justice. I could name a great many processes that have been current for the last few years as new secret methods which are mere transcripts—in some cases almost literal—from these pages.

Now, if Herr Schrank had only "bided a wee," instead of giving to the world, through the medium of the Vienna Photographic Society, his great idea for eliminating the hyposulphite from prints, how he might have gained in kudos and in pelf! The syndicate would have passed the method without a murmur. The secret is simply to wash the hypo. out "*by means of a stream of electricity!*" There is daring originality of conception! Should, however, the method fail of attaining complete removal, it might be finished off by gentle suffusion with a few buckets of violet rays, and perhaps the gentle application of odic force. We are evidently progressing!

I have learnt several things lately, and, strange to say, not from The British Journal of Photography. For example, that shellac contains "four per cent. of fatty ink," and that to *albumenise* plates the method is to agitate the yolk with broken glass till it becomes frothed albumen, and to coat the plates with this mixture diluted with water with a little ammonia—another prematurely-disclosed secret that would have again passed the syndicate without question as to its originality.

Speaking of eggs there can be little doubt that M. Rivot is correct, for it should be known that an egg will hatch when three weeks' old; and surely no one would venture to say that an egg which was possessed of that amount of vitality could possibly be bad, or injurious to permanency, if egg albumen is to be used at all.

Have my remarks, I wonder, on residues from carbon printing reached Dr. Schnauss's ears? He finds now that he cannot advise the carrying out of his previous suggestion to attempt to recover the carbon from the water in which tissue had been developed. He remembers it is so fine that it cannot sink, especially as the glue helps to suspend it. Possibly he may soon cease to advise the recovery of the bichromate by means of a lead salt, for the market is scarcely yet educated up to the point of purchasing the dirty-green pigment which would result from the necessary admixture of the impalpably fine carbon with the precipitate of chrome yellow to be obtained by his process. Tertiary colours, no doubt, are very telling, but one likes to mix one's own shades.

There was a rather suggestive letter on this carbon subject in the same number that contained my last lucubrations. It contained much to approve of, but along with it a certain amount that I can scarcely hold with. The Autotype Company have apparently a monopoly, it is true, but we do not feel it to be any encumbrance; indeed, rather the reverse, for they are enterprising, and they spend pains in perfecting their material. So far they have never molested anyone. But carbon working is daily growing in importance. There is an old saying we should always remember about the *patte de velours.* Free Lance.

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FOREIGN NOTES AND NEWS.

Mr. Gaffield's Collection of Glass.—MM. Champion and Pellet's Experiments for the Determination of the Nitrogen in Gun-Cotton and Collodion.

At the last meeting of the Vienna Photographic Society, Dr. Schwarz-Senborn gave an interesting account of a visit to the glass factory of Mr. Gaffield, of Boston, whose researches on the action of light upon glass are so well known. The most interesting part of the visit was that to the collection of coloured and uncoloured glasses which Mr. Gaffield has been accumulating since 1863, and which comprises pieces that have been exposed to the action of light for a longer or shorter period varying from three days to seventy-three years. Amongst these were some illustrating Faraday's discovery of fifty years ago, that colourless or slightly-coloured glass exposed to intense sunlight becomes purple or takes on various other colours, and that in time these become darker.*

Mr. Gaffield is also convinced that the supposition that the beautiful, brilliant colours observable in old stained glass were produced by a now lost art is a mistake. It is, he thinks, produced by the action of air and exposure to the light. In his collection he has at present a glass window which was placed, in 1794, in the church at Lexington, Massachusetts, and removed in 1846, in which one can see that those parts of the glass protected by lead or cement from the action of light and air have a different and less clear and brilliant hue than the exposed parts. He has also observed the same thing in the case of fragments of old glass from the windows of old English churches.

The text of MM. Champion and Pellet's account of their experiments to determine the amount of nitric acid in the organic matter and the chemical composition of various gun-cottons, collodions, &c., of which a condensed account was given some time ago, has recently come to hand, and runs as follows:—

"According to our experiments organic substances containing nitric acid are wholly reduced and behave like nitric salts under certain conditions of the ferric salts (salts of ferrous oxide). Starting from this fact we have employed, with a certain modification which will be given hereafter, the methods of Pelouze or Schlösing for the determination of the nitrogen.

"If the nitrous substances were not volatilised by steam we used the apparatus given by F. Jean (in the *Bulletin de la Société Chimie*, June, 1876, page 13) for the analysis of nitrous salts; that is, we took a balloon of about 250 c. c. contents, furnished with a caoutchouc stopper, into which two tubes were led, one of which was dipped into a vessel filled with water, while the lower end of the other was drawn out to a point, the upper end being furnished with a funnel and cock and serving for the introduction of liquids. To commence: the part of the tube between the point and the cock is filled exactly with distilled water. 0·5 of a gramme of the organic substance is placed in the balloon, and to that a few grammes of ferrosulphate of ammonia (sulphate of ferrous oxide of ammonia) and about 50 c. c. of water are added. The balloon is then closed and heated until it boils, and boiled until all the air is expelled by the steam. Under these conditions the ferrous salt has no action upon most stable nitrous compounds. The mouth of the gas-developing tube is then placed under a cube-shaped bell, and the funnel is filled with a mixture of muriatic and sulphuric acid, which is allowed to enter slowly through the drawn-out point. The addition of sulphuric acid is intended to accelerate the decomposition of the nitrous compounds. After the addition of about 50 c. c. of the mixture of acids the cock is turned off, and the mixture boiled until absolutely no more gas is given off. The volume of the gas is then determined, and the nitrogenous contents computed according to the formula for the analysis of the nitrous salts. If fluid compounds—such as nitro-glycerine or nitro-glycol—should be likely to be in the substance examined the process described above has to be modified, as under these circumstances part of the substance would be seized by the steam (water vapour) during the boiling and carried off by it. One then commences by determining the potassic permanganate contents of a solution with a solution of sulphate of iron heated to boiling point and deprived of its colour, with the addition of exactly the requisite quantity of muriatic acid and chloride of zinc. A certain volume of the iron solution, bleached as already mentioned, is placed in a balloon, and the fluid is then allowed to cool in presence of a stream of carbonic acid or under a film of petroleum. 0·5 of a gramme of the nitrous compound is then introduced, and the whole warmed in a water bath. When the substance is completely decomposed it is brought to boiling point in order to drive out the nitrous oxide, and potassic permanganate is again added. When employed with nitro-glycerine this method gave us only 18·3 per cent. of nitrogen instead of 18·5 per cent., which are the theoretical contents."

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* A good specimen of this on a large scale may be seen in the roof of the platform of the Western Railway Station at Vienna, where all shades and tints are to be seen, from pale blue, yellow, and green to dark purple and violet.

With reference to the composition of gun-cotton the writers remark:—"According to the aggregate condition of the cellulose, and the duration of the immersion in the nitro-sulphuric acid, one obtains nitrogenous compounds containing various quantities of nitrogen, as has been stated by various writers. Abel, for instance, gives $C_{12} H_7 O_7, 3 N O_5$, as the formula for compressed gun-cotton prepared by his method, which would answer to tri-nitro cellulose. But our analysis does not agree with that of the above-mentioned *savant*. We have, in fact, got the following results:—

	Obtained.	Calculated.
Carbon	26·18	26·23
Hydrogen	2·81	2·73
Nitrogen	12·78	12·75
Oxygen	58·23	58·29
	100·00	100·00

corresponding to the penta-nitro cellulose of Pelouze:—$C_{24} H_{15} O_{15}, 5 N O_5$. We also found that the gum-cotton prepared by ourselves, as well as the Russian collodion (which M. Carette kindly supplied us with, and which gives special properties to photographic collodions prepared from it), corresponded to this same composition.

"According to our experiments, pyroxyline paper only contains two equivalents of nitric acid, having the formula $C_{24} H_{18} O_{18}, 2 N O_5$."

Our Editorial Table.

Ross' Rapid Symmetrical Lens.

Since we last had the pleasure of critically noticing the system of lenses introduced a few years ago by Messrs. Ross and Co., under the designation of "symmetrical," another branch of the symmetrical system has been developed, namely, a series possessing more rapid action than the former. Of these we have had one for 8½ × 6½ plates placed at our disposal for trial and review.

The lenses of this compound are one and a-half inch in diameter, with a fixed stop only a quarter of an inch less than this. When we consider that the equivalent focus of the combination is eleven inches it will be seen that the intensity of light, when the lens is worked with full aperture, is quite sufficient to justify the use of the prefix "rapid." Each lens is a cemented compound of the meniscus form, the correction being effected, in the manner now so much preferred, by placing the denser element of which the lens is composed to the outside, forming the convex surface. We may add that, unlike the "doublet" lens at one time manufactured by this firm, the rapid symmetrical is not fitted with rotating but with Waterhouse diaphragms.

Upon subjecting the lens to the practical test of being worked upon plates of adequate dimensions, we find that it possesses most admirable covering power, the flatness of field, even when used without any diaphragm, extending over such an area of the plate as to render it extremely easy to obtain a sharply-defined group upon a plate the full size intended to be covered by the lens. With a stop of half-an-inch in diameter ($\frac{f}{22}$) a landscape was obtained possessing full pictorial sharpness to the edge.

In connection with the use of lenses of this class there is an existing fact that does not appear to be so well known as it ought to be—at least we draw this inference from queries continually being put to us—namely, that any one of the lenses of which this or any other symmetrical combination is composed may by itself be used as a landscape lens. When one of the lenses of the combination now before us is used singly it covers a plate 18 × 15 inches. But, of course, it must be used with a small stop to do this, and equally of course, when used in this manner, it does not produce pictures quite free from distortion. And here we may observe that when testing the symmetrical lens in its combined form there was not visible the slightest trace of distortion; nor, when we note its peculiar formation, is it possible to imagine that it could be otherwise. In conclusion: we give this lens a hearty welcome as a most useful addition to photographic apparatus.

Meetings of Societies.

GLASGOW PHOTOGRAPHIC ASSOCIATION.

A meeting of the above Association was held in their Rooms, 172, Buchanan-street, on Wednesday, the 14th inst.,—Mr. J. J. Long in the chair.

The minutes of the previous meeting having been read and approved of, and two new members elected,

The Chairman asked if any of the members present could tell him what was the best film for microscopic work, granularity or structure of any kind being what he wanted to get rid of.

Mr. Dodds replied that there was an article in The British Journal of Photography of that week on the subject, and that ordinary collodion, a little thinner than usual, was what the writer advised to be used.

Mr. Smithells thought the collodio-bromide emulsion with alkaline development would prove extremely suitable, and would give little texture or granularity.

Mr. Robertson (Secretary) then read the following communication from Mr. John Urie:—"With the view of eliciting discussion on a subject I deem of considerable importance to our profession, I beg to submit the accompanying suggestions, which, if you deem advisable, may be read to the members. You are, no doubt, aware that Mr. Swan's patent on the carbon process expires next February, and the Autotype Company will doubtless use every effort to obtain an extension of the same, and thus prevent the improvements that would be certain to follow from healthy competition if the matter were thrown open to the profession. The carbon process has already raised considerable controversy in the journals, and I would further remind our members of the motion, passed last season, binding us to use every means to prevent a renewal of the patent. My sole reason in taking this course is that the process may be untrammelled, and improvements effected in the manipulation, instead of being worked by a few licensees, as at present—some eight or ten in Glasgow, and only one or two practising the process, and that to a very limited extent. Now, as the Autotype Company seem to aim at the establishment of a monopoly of this process by buying up all the patents connected with the subject, and as Mr. Swan's patent is the basis of all the others, I would humbly suggest that it is our duty, seeing it has no valid claim to originality, to oppose by every legitimate means its extension, as it is well known that many others worked the process before the date of Mr. Swan's specification. Proof of this can be produced, written and otherwise, to convince the Lord Chamberlain that the subject of the patent was not new, and that the Autotype Company in this monopolising spirit were seriously impeding and hurting the advancement of the art. In support of this view we have the written testimony of Fargier, Ponton, Poitevin, and Blair, besides many others, who had previously used the same. But, in addition to this, there is another flaw in the patent, namely, that in the provisional specification and the final one different principles are mentioned—an error at once fatal and illegal, as decided by the highest law court in the country within the last few weeks in the case of Messrs. Bailey and Son, manufacturing chemists, Wolverhampton, against a person in our city for using an invention for preserving meat, known among butchers here as the "doctor." Now the only difference in the provisional and final specification is that in the former bisulphate of lime and gelatine is used, and in the latter bisulphate of lime may be used alone. Judgment was given for the defendant, as a case in every respect parallel. Another reason that should stir us up in the matter is that one of the partners of the Autotype Company was in Scotland the other day endeavouring to buy back the licenses from those who have the right of granting district licenses. Now, what is the meaning of this if it be not to continue the monopoly? Again: I have been told that proceedings have been threatened against parties who have gone into enlarging for the trade. Now, in the face of these facts, is it not time that we should be getting up proof and a fund to combat these proceedings? If the Autotype Company really consider these patents valid, why do they not at once settle the matter in our courts of law? But I fear they know the weak points too well to trust to the searching examination of a Scottish court. In conclusion: my advice to all is to work away, for if I thought the process a commercial success—which I do not without further improvement—I would at once adopt the carbon process and ask permission from no one, as I have worked it before the existence of any of the Autotype Company's patents, and will do so again when more perfect."

The Secretary said:—After I received Mr. Urie's letter I thought I would take a look at the Autotype Company's advertisements. I referred to The British Journal Photographic Almanacs and have made the following jottings:—In the 1868 Almanac I do not find any autotype advertisement. But it may not be far wrong if I note *A Carbon Process on Mica*, by M. Despaquis (six sheets for six shillings), and a book by Mr. G. W. Simpson on *Photography in Pigments*—a work containing a full account of Swan's carbon process, price 7s. 6d. If our Society or any of the members have a copy of this work I would like to see it. In 1869 the Autotype Printing and Publishing Company, Limited, announce that they are the sole proprietors of Swan's patent for printing in carbon; they grant licenses to use the patent process in consideration of an annual payment of ten pounds, and they caution photographers against pretended improvements of the process which are mere colourable infringements, against which it will be the duty of the Company to protect their interests and those of their licensees. In 1870 the Company give, gratuitously, practical instruction in carbon printing. The purchase of the apparatus and material at the foregoing prices includes the right to use them without license. Licensees paying the Company a final sum of thirty guineas are supplied with apparatus, pigment, paper, &c., at a discount of from 25 to 33½ per cent. In the 1870 ALMANAC Mr. J. A. Spencer says he has recently erected machinery for making pigmented gelatine paper as employed in the processes of Poitevin, Fargier, Blair, Pouncy, Edwards, &c. In 1871 the Autotype Fine Art Company, Limited, advertise a sensitive pigment paper; also their new pigment paper—both at twopence per square foot. Licensees have the right to use Swan's patent, Johnson and Edwards' patent, instructions being given gratuitously every Friday, and an autotype manual is announced. Mr. Spencer, having devoted much attention to the preparation of pigmented paper for printing in carbon or pigments, says he is prepared to supply this material of very superior quality at threepence per foot; also actinometers, squeegees, transfer paper, and other requisites for carbon printing. In 1872 the Company give a list of their directors, superintendents of departments, &c. Among these Mr. Spencer's name is found. The business is now divided into three departments—the solar, chemical, and mechanical departments. In 1873 the Autotype Fine Art Company, Limited, beg to announce that the exclusive rights in their patents, together with the factory, works, and plant at Ealing Dene, have been sold to Messrs. Spencer, Sawyer, Bird and Company, and that they will receive orders and grant licenses. In 1874 the Company speak in their advertisement most about the prize medal they got from the Council of the Photographic Society. In 1875 the same advertisement is repeated. In 1876 Messrs. Spencer, Sawyer, Bird and Company have the satisfaction to announce that they have purchased the goodwill and copyrights of the valuable stock-in-trade, also lease of the noble gallery, late the property of the Autotype Fine Art Company, and their advertisement contains M. Lambert's tissues, presses, and materials for licensees. In this number M. Lambert advertises Lambertype, contretype, chromotype, self-registration, and issues challenges of £200 against £50 to the world, or £50 against nothing. See journals for August, 1875. In 1877 the Company show a registered trade mark—the rising sun. They have dropped the title of Spencer, Sawyer, Bird and Company, but have the single name of the Autotype Company, Mr. Bird as general manager, Mr. Sawyer as director of works; and they have effected important modifications in the manufacture of pigmented tissues, which, with the recent great advances in the process of double transfer, renders permanent printing sure and easy, with results fully equal to the best work done in silver. I have looked at one or two advertisements in last year's journals. In January M. Lambert is announced as having engagements for Canada and the United States, and M. Lambert, jointly with the Autotype Company, will give a reward of £200 to any person who, without using their patents or materials, will produce in the same length of time the different styles of portraiture, permanent and artistic, obtained by the Lambert process. The last advertisement announcing the silver medal award seems to adopt the name Edinburgh people gave them—the London Autotype Company. I do not know whether these jottings are of any use, but curiosity compelled me to make them. I am inclined to think there is some interest and instruction in seeing the changes and development of the Company. I think we may say it originated with Mr. Swan, of Newcastle, and after many changes it seems now to be the property of two men, viz., Mr. Bird and Mr. Sawyer. I guess this from the advertisements as they now appear.

After Mr. Urie's communication had been read, and Mr. Robertson (the Secretary) had made his statement, a discussion ensued.

Mr. GILFILLAN said he believed a committee had been formed last year, when the above notice of expiry of patent was first pointed out by Mr. Urie, their duties being to correspond with other societies and ascertain their sentiments on this important matter; but the members of that committee had seemingly omitted to take proceedings, and he now proposed that the Society should come to the conclusion to raise objections to the renewal of the patents.

Mr. URIE thought, with Mr. Gilfillan, that the movements of the Autotype Company should be watched, and when it was found they made an application for renewal objections should be raised.

The CHAIRMAN said it would be better to ascertain the sentiments of other societies before proceeding further.

Mr. Johnston was then called upon to read his paper on *Organic and Inorganic Matter: their Use in Bromide of Silver Emulsions.* [See page 139.]

After a few questions, asked by some of the members, had been answered and explained by Mr. Johnston, that gentleman was accorded a hearty vote of thanks for bringing the subject before the Association.

The SECRETARY then drew attention to a number of photographs (exhibited by Mr. George Mason) by M. Klary, of Algiers, which would show the members the effects to be obtained by his so-called "improved mode of lighting;" also, some more specimens by Mr. Paton in further development of his imitation of M. Kareline.

Mr. PATON said that at the previous meeting he had stated that in order to prevent his white window curtains from coming out a mere mass of white, he had recourse to colouring them slightly with orange chrome; but he now found that to be wholly unnecessary, as, by putting the dark background which formed the sides of the window, they were easily photographed so as to come out quite distinctly.

The members considered Mr. Paton's pictures really excellent, showing improvement on those previously exhibited.

Mr. URIE thought the thanks of the Society were due to Mr. Paton for the courteous manner in which he had come forward and explained his experience in that pleasing and attractive kind of portraiture.

Mr. GEORGE MASON pointed out that Mr. Urie was of opinion that the patent the renewal of which was under discussion was not a valid one, and the Autotype Company, according to his statements, could do him no harm if he persisted in working in carbon despite the Company; and if such were the case why should the Society be asked to fight against nothing? Those who were not patentees and wished to work in carbon, but objected to paying any royalty, and were as confident as Mr. Urie that they could not be restricted, should at once set to work with the process in defiance of the Autotype Company.

Mr. URIE replied that, though not fearing the result, the mode of procedure referred to would likely cause any artist, personally, a considerable deal of trouble and possibly expense, and therefore thought the course he advocated, viz., the formation of a committee and the appeal to kindred societies for help and support, the better plan.

Mr. DODDS stated that Mr. J. A. Spencer, late of the Autotype Company, had himself, before he became a partner, held that the patents were *not* valid, and no restrictions could be placed on his working the carbon process, which he had proved by practising it for a considerable time in spite of the Autotype Company's attempts to stop him.

Mr. MASON said Swan's patent—the one under discussion—was a single-transfer process, and that it could not harm to any extent those who were Lambert patentees, seeing theirs was the double transfer.

Messrs. Urie and Dodds declared that both single and double transfer were included in Swan's patent, the only thing (Mr. Urie further pointing out) being that Swan did not claim the use of unsensitised paper or tissue in his provisional specification, his mode of working it being the pouring of the collodion and carbon on a sheet of glass and then stripping the film off, ready sensitised.

Mr. GILFILLAN thought it would put a stop to a lengthened discussion if they at once appointed a new committee, for most of the members present seemed to see the necessity of one, and he would therefore move a resolution that a new committee be appointed to oppose any application for the renewal of Swan's patent by the Autotype Company, and to confer with other societies in order to elicit their sentiments and secure their co-operation.

The motion having been seconded by Mr. McPherson, the following gentlemen were appointed on the committee:—Mr. Bowman, Mr. White, Mr. Urie, Mr. Smart, Mr. Bell, and the Secretary.

The CHAIRMAN said he believed the idea was a good one, and could see, with Mr. Urie, that carbon printing would receive a great impetus and its advancement be materially affected if the patent rights could be got rid of.

Mr. MASON drew attention to the somewhat anomalous conduct of the gentlemen who were advocating resistance to the renewal of patent rights to the Autotype Company, in so far as for many years they were quite at liberty to work the carbon process if they choose without paying any royalty, but seemingly none, or at least very few, of them availed themselves of the liberty. To them it existed as a scientific fact alone, as of commercial value it was nowhere; but immediately M. Lambert appeared, and, by paying a royalty or buying the right, a few of their neighbours got an advantage over them, they seemed to be suddenly awakened to the fact that as a commercial speculation the carbon process was likely to prove a success, and now they longed for the liberty they once had, but thought light of, until it was taken from them.

The SECRETARY stated he had read M. Lambert's specification over carefully, but could not for the life of him see what he (M. Lambert) had to give in return for £30; and he would like very much if anyone would enlighten him.

Mr. MASON suggested that Mr. Paton, whose specimens of chromotypes the members had seen for the last two nights, would be best able to inform them.

Mr. PATON said that, having previously been bitten by buying up the rights of patent-mongers, he felt exceedingly chary when Mr. Mason wrote to him acquainting him with M. Lambert's arrival; but, after having seen M. Lambert work, and the exceedingly beautiful results obtained by the process, he had bought up the right for his particular district. Unlike his other patent purchases, this one hsd proved a commercial success in his hands, although he had previously known nothing at all of carbon printing. He (Mr. Paton) further pointed out that M. Lambert had enabled photographers, by his improvements and modifications, to produce small *carte* work in carbon, which before his advent was almost exclusively used for work of a large size. He believed there were some men here and there working the carbon process without paying for a licence, but those had got the liberty from the Autotype Company before M. Lambert had come to the front; but still the materials those gentlemen obtained were not at all to be compared for excellence with what he (Mr. Paton) got, and further, small work was beyond them. He felt quite satisfied with his purchase, and considered he had got an adequate return for his money.

Mr. MASON also explained that Lambertypes were altogether different things from the usual productions of the Autotype Company, and that those gentlemen of whom Mr. Paton spoke, who were still working in carbon without paying a royalty, had been workers in it for many years, having, when they first purchased their materials from the Autotype Company, obtained the right, the Company, at that time, granting the liberty to those who purchased the materials from them.

Mr. Urie stated positively that he had produced pictures in carbon, fifteen or twenty years ago, and could do so again. He had placed on the table, last season, pictures quite equal to those now produced by Mr. Paton, although he had never seen the Lambertype process worked; and now, because he had not purchased his materials from the Autotype Company, and objected to paying the holders of Lambert's rights the sum demanded, he was debarred from using the process or improved materials. Mr. Paton had stated that he did not know anything about carbon printing until instructed by M. Lambert, for which lessons he paid a considerable sum; but what was he (Mr. Urie) to get in return for his money when he knew all about the process already? Was it only that better materials would be supplied by the Company, as if they were in the habit of supplying indifferent materials to others? But they were not asking to work Lambert's patent. All they wanted was to prevent the renewal of an old patent that had run its legal term of fourteen years, and if M. Lambert had brought out anything new the proposed course would not interfere with his rights.

With a vote of thanks to the Chairman the meeting was brought to a close.

Correspondence.

CARBON POISONING.

To the Editors.

Gentlemen,—In the correspondence column of your last issue I see that Mr. John Forbes says he is suffering from ulcers in his hands caused by the use of solution of bichromate of potash, and he asks if that is the general experience of those who use it. Allow me to say that it is very general with many that work much with the solutions of the alkaline bichromates; but, like the solutions of cyanide of potassium, it may be used by some with impunity, while others can scarcely touch it without being affected by it. I myself have used cyanide with impunity for some twenty years for removing stains from the hands, generally using a lump *a la* pumice stone, without being affected, so thought from this that my skin was stout enough to resist the evil effects of the bichromate. But such was not the case, as my carelessness soon taught me, the first symtom being a violent itching of the back of the hands and arms (in hot weather I frequently divested myself of my coat, hence the arms got splashed when developing), especially at bedtime or when the body became heated, and upon looking closely into the skin a fine rash was perceptible. The treatment suggested by Mr. Spencer soon effected a cure. It was to apply, after thoroughly washing with soap and water the affected parts, a lotion composed of Wright's *liqnor carbonis detergens* diluted with five parts, by measure, of water.

The best preventive I know is, immediately after sensitising tissue, to wash the hands in very dilute ammonia, which removes the stain, and then to well scrub the hands with a brush in hot water, using plenty of soap, followed, if necessary, with the lotion. The hands should never be allowed to dry with the hot water used for developing carbon prints upon them, as minute particles of the bichromate will be left on them at a time when the pores of the skin are open. They should always be rinsed with cold water before drying.—I am, yours, &c., E. W. Foxlee.

Acton, W., March 19, 1877.

To the Editors.

Gentlemen,—Your correspondent, Mr. John Forbes, in last week's Journal, raises certain questions with regard to carbon poisoning. As this is a question which affects the comfort and health of workers in carbon, instead of shirking the matter, as is done by the principal carbon printers, let the question be met manfully, and endeavours made to find out some remedy for the evil; for, though it may be convenient for vested carbon interests to pooh-pooh this matter, still health ought to be, and will be, before every other consideration.

It is now becoming well known that one of the drawbacks to carbon printing is the great risk the manipulator incurs in having poisoned fingers. This is one of the penalties which afflict many operators in carbon. Of course, a few are exempt from sufferings (just as a few individuals to cure simple abrasion of the skin use cyanide of potassium), but sooner or later, and in a lesser or greater degree, the manipulator in carbon will pay the penalty; for not only does it affect the fingers and hands, but the whole system is brought under the deleterious effects of the bichromate of potash. A few years ago bichromate was recommended to clean plates, and the writer of this letter adopted it for a time, but was compelled to give it up, for its baneful effects were dreadful, causing the same ulcerated fingers and hands of which Mr. Forbes complains, and this was the experience of others who used it. A glance at the bottle of bichromate crystals is sufficient now to give me the horrors.

Some constitutions are very susceptible to the influence of the bichromate in solution, even a smell at the bottle giving a feeling of uneasiness in the head, while a small quantity dropped on the hand soon causes a sore, though the hands be well washed after the contact.

The cure is tedious, and ought to be under the watchful eye of a medical practitioner, for the principal remedy is arsenicum; but, as an adjunct to ease the sores and fissures on the fingers, a little orange water and glycerine is exceedingly comforting. The question propounded you is—"Can carbon poisoning be prevented?" I leave the answer in the hands of those learned societies who profess to have at heart the success of the photographic profession.—I am, yours, &c., Humanity.

Chester, March 19, 1877.

FINISHING CARBON WORK.

To the Editors.

Gentlemen,—Please allow me to call the attention of artists who finish carbon pictures in monochrome to the fact that madder-brown is a bad colour to mix with lamp or ivory black. The madder fades, and leaves the black in a cold state.

I would suggest indian ink and indian red as the proper colours. I have used them for years, and find them stand the light well.

I have often thought that a lead pencil might be made of this colour (not crayon). Is there any reason why this cannot be done?—I am, yours, &c., R. D.

Cheltenham, March 20, 1877.

AN UNACCEPTED CHALLENGE.

To the Editors.

Gentlemen,—After all that has been written so strongly and so persistently concerning the superior sensitiveness of uranium plates, I confess to a feeling of deep disappointment in discovering that Captain Herbert Kerr and, through him, Colonel Stuart Wortley, the present and past manufacturers and sellers of these plates, should proclaim the real extent of their faith in their productions by declining to accept the challenge I have so plainly given them. Discretion is well known to be the better part of valour; and, notwithstanding the various excuses made or implied for these gentlemen deciding not to test their productions against mine with a view to finally settling the question of superiority, and the silly gasconade of one trader speaking on behalf of another concerning a "foeman worthy of his steel," the far-seeing public will only laugh at it, and attribute such prudence in not meeting me to its true cause.

Verily do some people entertain queer notions as to what dignity consists in. Here we have the farcical spectacle of one trader in dry plates endeavouring to hoist his predecessor into a position so dignified as to enable him to look with superciliousness upon a third, and successful, rival trader (myself). Up to Tuesday evening last I had considered Colonel Wortley worthy of *my* steel; but after the revelations concerning uranium made that evening at the meeting of the Photographic Society of Great Britain, I leave it to you, gentlemen, to judge whether I should not best consult my own dignity by sending my assistant to meet him in the field, instead of going myself. So anxious, however, am I to get a public trial made, so as to establish the comparative merits, as well as rapidity, of the plates issued respectively by Colonel Wortley and Captain Kerr on the one hand, and by myself on the other, that I shall not strain *this* point.

Why talk of my process as a "secret" one? Is it not patented, and as such described in my specification? And, besides, has not Colonel Wortley himself declared that there is nothing new in it?—that I merely work the old formula of Dr. Maddox? If this be so, where is the secresy? And may not the retort be made by inquiring of Colonel Wortley (the framer) and Captain Kerr (the purchaser of the formula for the preparation of uranium plates) why, in the interests of science, *their* process is not divulged.

It is drawing a red herring across the scent to propose that I should join Captain Kerr in offering a money prize for the production of a dry plate replete with every kind of excellence. It would prove a capital stratagetic movement on his part thus to obtain a good process, but it offers no advantage to me, who am already in the possession of such a process. But in limiting the use of a dry plate to outdoor or transparency work Captain Kerr does not evidently appreciate the possibilities of such plates. My idea of a good dry plate is one that shall answer for every purpose—portraiture in the dimly-lighted studio, as well as landscape in the bright sunshine—one which, while possessing keeping properties before and after exposure shall, in addition, possess all the sensitiveness of wet plates, combined with the recognised qualities of negatives produced on them. This, I am aware, is not *now* claimed for uranium plates, as shown in Captain Kerr's letter in yesterday's Journal; but in a dry process of the highest class nothing short of this ought to be tolerated.

In what manner gelatine plates fulfil these conditions I leave you, gentlemen, to judge from an inspection of the portraits enclosed (some of them babies), as well as of the landscapes, architectural and flower studies, clouds, and instantaneous subjects.—I am, yours, &c.,

8, *Maddox-street, W., March* 17, 1877. R. Kennett.

[The quality of the specimens enclosed is certainly everything that can be desired, and did we not know to the contrary we might have imagined them to have been produced by a rapid wet collodion process.—Eds.]

EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale*, that being done at a small cost in our advertising pages. This portion of our columns is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

A good *carte* lens will be exchanged for a Bigelow or other good background.—Address, F. M. Sutcliffe, Whitby, Yorkshire.

A first-class 7½ × 5½ mahogany camera, quite new, in exchange for a *carte* burnisher.—Address, Empson, care of W. Buttrum, Wolverton-road, Stony-Stratford.

Maughan's patent geyser for carbon printers, only used once (45s. size), will be exchanged for a 10 × 8, or larger, studio or landscape camera in good condition.—Address, J. Wrigley, Coston Park, Levenshulme, near Manchester.

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ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

L. O. Sammann.—In our next.

H. Manfield.—Received. In our next.

Dyer.—To utilise your overplus albumen pour it upon slabs of metal, and dry it rapidly. In this desiccated state it will keep good for years.

Amateur.—A letter addressed to M. Piquepé, 1, Malvern Villas, Milton-road, Acton, W., will ensure your obtaining the desired information.

Rusticus.—The borrowed light from the kitchen window described in your drawing is, in our estimation, sufficiently powerful to cause the fogging of which you complain. The remedy is obvious.

Alex. Henderson.—Instead of French chalk, a solution of wax will be found much better as a substratum for the collodion for the special purpose you mention. We shall endeavour to obtain fuller details.

Henry Stoddart.—We do not give lessons in photolithography, but we refer you instead to numerous practical articles on this subject which have appeared in this Journal during the past ten or twelve years.

Geo. B. Adams.—The definition near the margin of the plate is so very bad that we conclude one of the lenses has been removed—probably for the purpose of being cleaned—and returned to its cell in a reversed position.

Rev. S. Thomas.—Do not use glue of so brown a colour. There are nearly colourless samples—such as Russian or French glue—which will answer your purpose quite as well as the Scotch glue, without possessing its defects.

J. King (India).—Your lens query shall receive attention. The glass plates to which you allude are excellent. We must at present decline to recommend any special kind of sensitised albumenised paper. Some that we have had answered well; other samples were very unsatisfactory.

B. B. Piper.—The most convenient size for transparencies for the lantern is three and a-quarter inches square. A mat having an aperture of any suitable shape may be selected, and if a four-inch condenser be employed the whole of the picture will be seen brightly lighted up to the corners.

A Friend and Roman.—We are glad to hear of your success; but we have long been aware that the water in use in the Eternal City is renowned for anything but its chemical purity. A small still will make you independent, and we advise you to have recourse to that useful piece of apparatus.

St. Luke's.—If the solution be intended for mounting purposes let it be very thick and glutinous. If, on the other hand, it be intended for use in the formation of a pellicle the strength must be diluted to suit that or any other special purpose for which it is intended. Unless apprised of that purpose we could not give more definite information.

J. W. B. E.—The painter has this advantage over the photographer—that he can depict the creations of his imagination and fancy, whereas the poor photographer must trust to a matter-of-fact model ere he can produce a visible result; on second thoughts, however, we imagine that the "spirit photographer" must be excluded from this latter classification.

Auld Reekie.—First of all you must chlorise the negative. This is effected by applying to the surface a solution of bichromate containing a few drops of hydrochloric acid. The strength of this is of little moment. When the image has become white, wash, and apply a weak solution of sulphantimoniate of sodium. The once feeble image will now be converted into a deep scarlet colour.

Geo. Tisley.—In order to examine the nucleus of the transparent spot use a power of about an inch, and cause a strong beam of light to fall very obliquely upon the spot to be examined. Owing to the exceedingly minute dimensions of the nucleus it will be preferable to *search* for it by transmitted light, viewing it as a transparency; and, having got it placed in the centre of the field, then change the direction of the light and examine it as an opaque object.

Alfred Watkins.—1. We, like yourself, entirely failed to obtain an even film with your emulsion. It flowed smoothly enough, but when the plate was reared up on edge the film was so rotten as to break up and separate into clots. These we again returned into the test tube and added a considerable portion of plain collodion, together with as much ether as would make it thinner than when we received it. It now yields a tough, firm film; but the quantity left is insufficient to coat a plate of sufficient dimensions to enable us to try it properly in the camera.—2. We hope to be in a position to make some observations on folding-stands very soon.

Argent.—When the whole subject is epitomised in the briefest manner it amounts merely to this—the curvature of the posterior surface of the front lens is of such a nature as to form, by reflection, an image upon the ground glass. If the curves were altered, or even if the distance at which the lenses are mounted from each other were varied, then the "ghost" image would be dissipated.

E. L. (Jersey) writes as follows:—"Having seen it stated for the second time in your Journal that Mr. Gutekunst, of Philadelphia, has produced a photograph of the late Exhibition which is said to be the largest in the world, viz., ten feet long by eighteen inches high, and as I have not seen any comment good, bad, or indifferent respecting the picture, I take it for granted your readers are satisfied that Mr. Gutekunst has performed a feat unparalleled in the history of photography. I beg to state, for the information of your readers (Mr. Gutekunst included), that I have ten photographs in my possession ten feet long by twenty-four inches high, on one piece of paper. They were done in 1870."

A. Mackay (Bristol).—In our last year's volume we published a communication from Mr. M. Carey Lea upon the subject of the addition, to the sensitising bath for paper, of the product of the action of sulphuric acid upon gelatine. Such addition is stated to conduce to rapidity in printing, while at the same time the image is more vigorous and less metallic. With regard to your second query: it is well known that chemical action is greatly retarded in the presence of gelatine, and it is probable that long keeping, *without filtration*, as suggested by you, may bring about the thorough elimination of the free acid which would not otherwise occur, and thus remove an element which "must interfere most materially with the real action of the collocine."

Received.—H. B. Berkeley; Dr. J. Nicol. At the last moment we have been compelled, owing to pressure on our space, to hold over *Notes from the North* till next week.

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Coloured Opalotypes.—Messrs. Alfred Harman and Co., of Peckham, have favoured us with an opportunity of examining two large and singularly-fine photographic portraits on opal glass, which have been tastefully finished in water colours. They are enlarged from small negatives by a process employed by this firm with undoubted success. The colouring is very rich and delicate. Some time ago it evoked a feeling almost of sadness to see rich colouring upon a photograph that had been produced on opal glass, as there was every probability that in a brief period of time the photographic portion of the picture would become faded and discoloured, thus causing the work of the artist to be thrown away. We have seen a picture of this kind—the colouring of which had cost upwards of twenty guineas—that had faded in this manner, and nearly led to costly litigation. But by the powder process employed in the production of all the opal glass enlargements of Messrs. Harman and Co. this source of danger has no existence; for the material of which the photograph is composed is absolutely permanent—quite as much as, if even not more than, the pigments employed by artists.

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GOOD FRIDAY.

Owing to our usual day of publication next week falling on Good Friday we shall go to press a day earlier than usual, and publish on Thursday, the 29th instant. Advertisers and correspondents will please bear this in mind.

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LONDON GAZETTE, *Friday, March* 16, 1877.

Partnership Dissolved.

James Cole and James Poole, Teddington, photographic printers.

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METEOROLOGICAL REPORT,

Observations taken at 406, Strand, by J. H. Steward, Optician.

For the Week ending March 21, 1877.

These Observations are Taken at 8 a.m.

March.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks.
15	29·96	NW	41	44	52	40	Dull
16	29·58	W	40	43	50	41	Cloudy
17	29·60	W	36	39	51	32	Fine
19	29·60	E	35	37	47	31	Foggy
20	29·36	NE	34	37	42	33	Dull
21	29·30	NE	35	37	40	33	Dull

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 882. Vol. XXIV.—MARCH 30, 1877.

CLOUD NEGATIVES: THEIR DEVELOPMENT AND GENERAL TREATMENT.

The value of clouds as an artistic adjunct to the quality of a picture is becoming more fully recognised every season, if we may judge from the steadily-increasing attention which is devoted to the subject in the various photographic periodicals. But though numerous articles have been published during the last year or two bearing upon the production of cloud negatives, they are almost unanimous in their treatment of the subject, dealing, as they do, solely with the mechanical arrangements necessary to secure the proper exposure without venturing further to describe the development and subsequent operations.

This would lead to the supposition that the purely photographic part of the manipulations is entirely free from difficulties, and that all that is necessary to enable us to produce simultaneously both landscape and clouds is a sky-shutter or other mechanical arrangement for protecting the sky from the action of light during the greater portion of the exposure. It is probable that such an idea has, more than anything else, tended to the suppression of any systematic attempt at improvement in this class of work; for we can readily believe that a photographer commencing to *attempt* the production of clouds and provided with a complicated mechanical arrangement for securing the necessary difference of exposure of the two portions of the subject, would be inclined to throw up the whole affair in disgust if unexpectedly met at the outset by difficulties apparently less easily surmounted than those already provided for.

While we would disabuse the minds of our readers of the erroneous idea that the whole of the difficulties lie in the direction of exposure we do not wish to alarm them by any overdrawn picture of imaginary troubles to be encountered. That successful renderings of cloud forms in all their delicacy of gradation are not to be secured at the first attempt is undeniable; but this does not arise from any difficulty, properly so called, inherent in the particular class of subject, but rather from the very great difference in the attendant conditions as compared with ordinary landscape work. Our object, then, is to call our readers' attention to the special points of difference, and to show where the technical difficulties really lie; and if by so doing we advance cloud photography one step in public favour we shall be amply rewarded. The subject must be divided into two parts—first, cloud negatives, pure and simple, which are to be used for the purpose of "printing-in" to other negatives; and, second, landscape negatives with clouds obtained by the use of a sky-shutter or other suitable mechanical arrangement. It is, to some extent, a matter of choice which plan be adopted, while in certain cases the selection will depend upon circumstances; but we think that there can be little doubt as to the comparative convenience in printing of the two systems when the negative is once obtained. It happens, however, most unfortunately that the system which offers the better chance of a result true to nature, besides giving the least amount of trouble in printing, namely, the landscape and cloud negative combined, presents also the greatest difficulties in its production (as the development must necessarily be made to suit the very opposite requirements of the brilliantly-lighted sky), and at the same time the greatly inferior illumination of the terrestrial portion. These difficulties are not, however, insurmountable, as we shall endeavour to show.

We will first discuss the production of a negative of clouds only in which case we are able to devote the whole attention to the one object of securing contrast combined with softness in the rendering of a subject eminently unsuited to such a result. It is, we imagine, scarcely necessary to repeat the assertion that the successful combination of those two qualities is the result of a proper adjustment of the development to the exposure; but we must do so in order to call attention to the more than ordinary care required in this respect when the exposure is reduced to a minimum, and, consequently, the latitude which is subsequently allowable in the development of the image. In ordinary landscape work we know that a wide limit exists in the matter of exposure, within which it is possible, by varying the development, to produce satisfactory results; but when the exposure is curtailed from minutes to seconds, or fractions of a second, the power of modifying the development is proportionately diminished, hence the necessity for an increase of care in the matter of exposure, as well as the adoption of a systematic method of development.

As regards exposure it will, of course, be found that this varies considerably according to circumstances, some descriptions of clouds requiring a comparatively long time to secure a proper impression, whilst with others it is almost impossible to give too short an exposure. The different classes of cloud will at first be found extremely deceptive in appearance. The light, fleecy description, known as *cirro-stratus*, which to the eye present a sufficiently marked contrast when seen outlined againgst the deep blue of the sky, appear upon the plate in a very different manner, while the huge piled-up masses of white *cumulus* which prevail at the present season frequently exhibit a wonderful amount of light and shadow. The first aim, then, should be to study the photographic peculiarities of the various kinds of cloud, as, until a certain familiarity is attained in that respect, all else is of little use.

When clouds alone are to be treated it is a matter of minor importance what process be adopted; but it is not advisable to employ one calculated to give too great density. What we have to strive after is chiefly softness, with just sufficient vigour to prevent an appearance of "muddiness," but not sufficient to make the sky the most striking portion of the picture; except in cases where the picture is really intended as a study of clouds, the fact should be steadily borne in mind that the sky is accessory to the picture and not the picture to the sky. Dry plates are, perhaps, to be preferred on account of the greater control they are under during development, and also because their inferiority in point of sensitiveness to wet plates obviates the necessity for such extreme care in exposure as is required with the latter. These may, however, be used, and will, no doubt, be preferred by many; but the very rapid descriptions of dry films are, for clouds alone, *not* to be recommended.

The method we prefer consists of a comparatively slow emulsion process; that is to say, an emulsion prepared with an excess of soluble bromide and used with a preservative *à la* collodio-bromide. With such plates we can secure a fully-exposed negative in a fractional part of a second, or the exposure may be extended to four or five seconds, or even longer if the clouds are not in rapid motion, without losing the vigour of the result.

The development is, of course, the most important operation; but, if carried out as we are about to describe, presents no special difficulties. We prefer to conduct this operation slowly, feeling the way, as it were, until the character of the image is recognisable, after which the course is tolerably plain. We commence with a full dose of pyro., say three grains to the ounce, a very small proportion of ammonia, one or two drops only of saturated solution of the carbonate to each two drachms of the developer, and a slight trace of bromide, though the last is, perhaps, not necessary. This enables us to judge if the exposure has been correctly timed. If the image commence to appear rapidly it is pretty certain that it is overdone; if, on the other hand, it come slowly but regularly, we judge it to have been about right, and proceed as occasion requires to increase the quantity of ammonia until the details are distinctly visible. At this stage one of the characteristics of the slow bromide films is of great value, namely, the vigorous image it gives by reflected light. This enables us to obtain a very thin image, perfectly visible in all its details, and yet devoid of density, but capable of acquiring it under subsequent treatment. With the more rapid films the finer detail is scarcely, if at all, distinguishable in the early stage, and considerable difficulty is experienced in judging of the real character of the image. When this stage is reached, the plate is well washed and intensified with pyro. and silver, which is much preferable to alkaline intensification.

Should the picture appear too rapidly the developer is poured back into the cup and the plate washed; add to the developer as much more restraining bromide as may be considered, under the circumstances, sufficient to stay the action upon the least-impressed portions of the image and flow it two or three times over the plate; then to each drachm of solution add two minims of dilute liquor ammonia (1 in 7), and again apply it to the film. If, as it should do, this produce the necessary contrast, proceed as before to intensify with silver. If the exposure be much too long the plate may be washed, flooded with a very weak solution of iodine (two or three drops in an ounce of water will be sufficient), again washed, and the development resumed. After this treatment, which should only be resorted to in bad cases, it is better to intensify after fixing. If the fault lie in the direction of under-exposure the proportion of ammonia must be at once increased, and its application continued until harmony is obtained, care, of course, being taken that the lighter portions are not, irrespective of density, rendered flat. The image is then fixed, treated with cupric chloride, redeveloped, and intensified to any desired extent.

Such is a general outline of the treatment of clouds alone; but when the clouds are to be developed simultaneously with a landscape it is obvious that greater care is necessary, but chiefly in arranging the proportionate exposures of view and sky. The same general rules of development will hold good, though it must be borne in mind that, in this case, the sky must be held subservient to the landscape, and should the exposure be ill-timed the defect must be remedied by other means rather than by altering the style of development. Of course the latitude permissible in the treatment of the landscape portion will allow of some little variation in the development to meet the requirements of the sky, but what we desire to emphasise is that the landscape must in no case be allowed to suffer.

Fortunately, it is by no means difficult to remedy a defective sky by other means. If too thin, it may be masked with tissue-paper or painted over with coloured varnish; if too dense, the mask may be applied to the landscape portion; or, when greater modification is necessary, a duplicate image may be produced upon the reverse side of the glass by means of emulsion and development or by the "dusting-on" process. If the former plan be adopted, it offers the advantage of being equally applicable to the production of a positive or negative impression, according as circumstances may require. Finally: if the result be beyond the scope of any of these devices the sky may be masked or painted out altogether, and clouds printed in from a separate negative if desired.

In conclusion: we may warn those of our readers who have had no previous experience in cloud photography that they must be prepared to meet and overcome a few obstacles before arriving at complete success. The difficulties will, however, be found to arise chiefly from an incapacity to judge correctly of the comparative value of cloud effects as rendered in the negative. This leads at first to a certain incongruity or want of harmony in the result, which, though unpleasing to the eye, it is difficult at once to trace to its proper source until some little experience is gained. These remarks are necessarily brief and incomplete; but to treat the subject fully would require considerably more space than we have at our disposal.

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THE LIME LIGHT WITHOUT OXYGEN.

It is now upwards of nine years since we gave details of a French invention by M. Bourbouze, by which an artificial light was produced by a mixture of atmospheric air and common gas (as in the well-known Bunsen burner) being allowed, when ignited, to impinge against a grating formed of fine platinum wire. The Bourbouze lamp was never much known, at least in this country; and it is now a thing of the past—so far, at any rate, as we have been able to ascertain.

Several years ago the great heat capable of being produced by a proper mixture of air and gas suggested the application of this mixture to lime as a means of rendering it luminous; and in 1869 we recorded the fact that Messrs. Darker, of Lambeth, had applied the principle of mixing air, instead of oxygen, with common gas, with a view to the production of the lime light. We are aware that they subsequently discontinued its use, owing to its not being so successful as they had anticipated.

With the foregoing, by way of introduction, we now proceed to describe a trial of a modified light of the kind referred to which was made by Mr. Woodbury in our presence on Monday evening. Mr. Woodbury's connection with the sciopticon, as co-patentee and as its introducer into this country, is known to our readers. Finding that photographers required a twofold advantage not afforded by the ordinary petroleum lamp of the sciopticon, and which is comprised in the two points—first a smaller flame, and secondly a purer light—finding, further, that a widespread objection exists against the making and storing of oxygen, Mr. Woodbury endeavoured to ascertain whether by means of some modified burner the "lime light" could be obtained without the use of any oxygen other than that contained in atmospheric air. The advantages arising from heating the air supplied to a furnace are familiar to everyone who has heard of the hot-blast smelting furnace; so likewise has this advantage on a smaller scale been known to those who are familiar with the Fletcher blowpipe, and by a judicious arrangement of the latter and applying it to the illumination of the sciopticon the light was obtained which we shall now endeavour to describe.

The burner is one nearly similar to that recognised as the "blow-through" jet—a blowpipe passing up through a larger jet, from which issues common gas. This centre blowpipe is connected with a bag or reservoir containing atmospheric air; but it is so constructed that previous to its insertion in the larger, or common, gas pipe it winds, like a corkscrew, through the flame of a Bunsen burner placed underneath. But as this corkscrew surrounds the pipe through which the common gas is conveyed, it follows that both pipes are heated, and, in consequence, both the gas and the air are ejected from their respective orifices in an intensely-heated condition. A lime cylinder, when subjected to the action of this blowpipe, becomes incandescent and highly luminous.

When two sciopticons were tested side by side, one of them being fitted with the well-known petroleum lamp having a double wick, and the other with a burner such as that here described, the two discs presented well-marked peculiarities. Previous to the lime-light disc being displayed, that from the petroleum-burning sciopticon had been carefully observed, and it was considered to be as bright and luminous a disc as it was possible to obtain from such a source of light. But no sooner was a second disc from the lime burner projected alongside of the first than the former immediately assumed, by contrast, a yellow hue. Not only was the lime-light disc of a purer colour, but it was also more luminous, taking a place between the ordinary light of the sciopticon and the oxycalcium light.

We should not like any reader to receive the impression that the hot atmospheric-air light is as good as the ordinary oxyhydrogen lime light, for such is not the case; but we affirm most positively that it is superior in purity and intensity to any oil lamp that we have hitherto seen applied to the lantern. We shall give a more detailed description of the mechanism of this burner shortly; in the meantime we are enabled to state that, while the light is sufficiently good for being used in the production of enlargements, the burner is so constructed as to be capable of being used with oxygen as well as with atmospheric air, in which case it is merely an oxyhydrogen burner of the "safety" description. From the foregoing it will be seen that no claim whatever is made for novelty of principle, but merely for such mechanical adaptations as permit this light to be applied successfully for lantern purposes.

BRICE'S TESTING PLATE AND ACTINOMETER.

When, three weeks ago, we gave an account of Mr. Brice's actinometer the specification of his patent had not been published. But since that time such publication has taken place, and we are enabled to give a description of the invention from the patent-office point of view.

The *object* of the invention is stated to be the furnishing to photographers of an "improved testing plate that may be readily applied to the camera, for the purpose of enabling them in a very convenient and reliable manner to determine, with considerable certainty, the quality of the chemicals employed, the quick or slow working of the lens, and to define whether the presence of fog or want of clearness in the picture is attributable to impurities of the chemicals, alkalinity of the bath, diffused light, over-exposure to light, or to other causes."

As we have already so recently given a detailed description of the actinometer itself we eschew that portion of the specification at present, merely observing that it is claimed that the transparent sheets are to be employed in any suitable manner in a longitudinal or lateral direction, and preferably so that the centre part of the glass plate is left free while the adjoining parts are covered with one layer of transparent material, the next adjoining sections of the plates plates covered by two layers or thicknesses, and so on with three or more layers to the ends or sides of the plate.

The testing plate formed by the layers of transparent material on the sliding glass plate is set up between the lens and the sensitised plate, in the mode we described in our previous article, and the picture is then taken in the usual manner. The result is a picture which produces the light, shade, or shadow of the object to be photographed with the chemicals and lens, and with light of more or less the same actinic quality intended to be used for the picture to be taken. When the picture is developed on the plate we find that the whole picture is visible, but that it is divided into sections of unequal intensity, being more or less distinct according as the light had to pass through one or more layers. The absence of fog at the place where the light had to pass through several layers or sheets of transparent material indicates that the chemicals are pure, that there is no diffused light, and that the nitrate bath is of proper acidity. If, at that section, details of the picture are clearly developed we can conclude that the exposure has been sufficient with the lens, light, and chemicals used.

The second section of the testing plate where the light had to pass through a less number of layers gives more or less the same information, but indicates more clearly whether the exposure has been adapted to the existing conditions or not. The next section indicates, if properly developed, what time, chemicals, &c., are to be used for the picture to be taken, while the middle or uncovered section indicates by the evident over-exposure that the lens is good and rapid in action, that the chemicals are in good condition, and that the light is sufficient in actinic power to produce good pictures with rapid exposure. The different sections of the testing plate admit thus, in a quick and reliable manner, a conclusion as to the quality of the chemicals, lens, and light, and furnishes thereby to the photographer a cheap and simple device for adapting himself quickly and successfully to circumstances, and produce good pictures without losing the best hours of the light by a failure of the chemical apparatus or erroneous length of exposure.

The special feature of novelty claimed in this invention is "a photographic testing plate or actinometer, made of a sliding glass plate adjustable in a suitable frame, and divided by superposed sheets or layers of transparent material into sections forming greater or less resistance to the passage of the light, substantially in the manner and for the purpose set forth."

ON PINHOLES.

We have today to give the results of some tentative experiments we have been making with the collaboration of a gentleman well known to the readers of this Journal, who has been working at the subject for some time past. They have given some remarkable results so far; and if they leave the theoretical part of the question still with a halo of doubt around it, we are able to help our readers so far as to promise them a method of treating their chemicals which shall banish pinholes, and have less objections than the methods so far made known.

We owe to Dr. Vogel and Mr. A. L. Henderson the suggestion to prevent these persistent troubles by the addition of nitrate of baryta to the bath. That this plan is efficacious is not open to any doubt, though the explanation of its action hitherto accepted we shall proceed to show to be faulty. But so many nostrums have been offered as panaceas for all the evils that baths are heir to, that at last operators and principals alike have had a surfeit of them, and can with difficulty be moved to make further experiments. To this and the dislike that all clean and scientific manipulators have to "mess" with their chemicals, and, above all, to add anything which shall interfere with the permanent integrity of the bath, must we ascribe the want of unanimity in accepting the process. It had also, as originally recommended, the almost fatal defect of producing veiled negatives which, however satisfactory for printing purposes, had a very unworkmanlike appearance to the eye. Recently it has been stated that so small a quantity as two grains of the baryta salt to the ounce answered the purpose, and left no unpleasant results upon the film.

It has been supposed that this salt precipitated the iodine combined with the silver in the bath. But if the result were to be a precipitate of iodide of barium there would require to be an amount of iodide of silver present beyond all possibilities, seeing that the iodide of barium is soluble in cold water to a considerable extent. The salt one might next look for with greatest probability is the *iodate* of silver, which, there is reason to suppose, would be formed from impurities in the iodides in the collodion, iodate at one time being a very frequent impurity in the alkaline iodides, though of late years a great step in advance of the purity of former preparations has been made; the iodate which once used to be found at the rate of two, three, and even more per cent. is now in English salts only occasionally discoverable as a trace. This salt, like iodide of silver, is insoluble in water; or, to put it accurately, is soluble to the extent of 1 part in 33,000, and it was open to the supposition that, like the iodide, a solution of nitrate of silver might take it up, and if this were the case the addition of nitrate of baryta would precipitate it.

Now, it has already been experimentally pointed out—notably by Major Russell, in the pages of our Almanac—that supersaturation by iodide was not neccesarily the cause of pinholes, and, indeed, for some time past the conviction had been gaining ground in our mind that some other explanation had to be sought. That it was from the presence of a slightly soluble silver salt was most probable, and that the supply of this salt was fed till complete saturation ensued by the double decomposition of constant additions from the collodion was also most probable.

The point of saturation being reached, it is evident that the first plate introduced would have a series of crystalline nuclei, owing to the salt, whatever it might be, which was produced by the double decomposition being precipitated in the crystalline form instead of dissolving into the bath, and these nuclei would grow by accretion the longer the plate remained immersed. In this connection it should be borne in mind that precipitates are not produced immediately upon the addition of the precipitant when weak solutions are used; and particularly is this the case when the result is crystalline in character. It now remains to discover what this salt—which we reasoned was unlikely to be either iodide or iodate—could be.

The method adopted was to experiment upon a bath of as old and pinholey a character as possible, by the addition of a small quantity of nitrate of baryta, the bath being previously filtered several times. A very slight cloudiness was the result, which was slightly increased by continued agitation. After allowing the whole to stand for a couple of days the bottom of the precipitating vessel was seen to be covered with a slight deposit, which darkened upon exposure to light. After separating and well washing the precipitate, the darkened part was easily removed by suitable solvents, and appeared to leave the main portion, apparently, undiminished in bulk. Having taken all precautions to ensure the absence of accidental impurities, dust, &c., we had here in combination with the baryta the acid of the presumed silver salt which caused all our trouble, and which was only likely to be either sulphate or iodate. On treatment with acids it remained apparently unaltered. The acid used we have, however, set aside for further examination, as we appeared to find traces of an oxalate.

Upon drying and fusing the precipitate with carbonate of soda upon charcoal in the inner flame of the blow-pipe, and placing the residue, moistened with dilute acid, upon a bright silver coin, the presence of sulphur in large quantities was most evident. The final test unmistakably proves the presence of sulphuric acid, though when we experiment upon a larger quantity we are by no means unprepared to find iodic acid.

Here we may introduce the practical bearing of our experiments. The quantity of precipitate obtained was so small in proportion to the amount of bath operated upon that we saw that even two grains to the ounce of the baryta salt was far beyond the requirements of the case; and, as the results of our further photographic trials in this direction, we found that if *five grains of the nitrate of baryta be added to half-a-gallon of bath all pinholes will be prevented.*

But here comes the main theoretical difficulty. Sulphate of silver, the text-books inform us, is soluble to the extent of two and a-half grains to the ounce of cold water; but nothing in any way approaching this quantity was obtained by the addition of the baryta, and hence the bath could not be saturated with the sulphate. We should not then expect it to crystallise either upon the plate or upon the side of the bath in the manner with which we are familiar, and the appearance of which we can reproduce by adding a soluble sulphate to a small quantity of bath in a test tube.

There is one not very feasible explanation. Sulphate of baryta is soluble to an appreciable extent in nitrate of ammonia, and the large quantities of this salt which exist in well-used baths would account for the absence of the large quantity of precipitate which might be expected from a saturated solution of sulphate of silver. Failing this we might fall back upon the unlikely supposition that there are facts yet to be learned with regard to conditions interfering with the solubility of sulphate of silver. It is possible, too, that the ammonia salts obtained from the collodion may assist in holding in solution small quantities of iodate.

Assuming, however, that sulphate of silver is the cause of all this mischief, the question which arises as to where it came from may be readily answered by an examination of the collodion and iodiser separately. We find none whatever in the iodiser; but the moment chloride of barium is added to the plain collodion we get a distinctly-marked precipitate which, upon after examination, proves unmistakably to be sulphate. As to how the sulphate gained admission to the plain collodion we need scarcely explain. The last traces of acids in making the pyroxyline are almost impossible to eliminate, and they are usually neutralised by an alkali.

We conclude our already long article by making a final suggestion. If the sulphate should prove beyond doubt to be the mischievous agent, all that will be needful will be to add a proper quantity of barytic salt to the plain collodion till the sulphates are thrown down. It would be very easy to do this, and to ensure absence of excess of baryta if it were thought mischievous. We hope, ere long, to be able still further to elucidate the theoretical part of this long-standing photographic stumbling-block.

MOUNTING PHOTOGRAPHS.

SEVERAL months have elapsed since we acknowledged the receipt of a specimen of a particular description of roller, well adapted for mounting photographs, for which Mr. Raphael Tuck had applied for letters patent. Provisional protection only has been secured, and the details of the invention are now thrown open to the world.

The specification, given in the language of the inventor, is as follows:—

> The object of my invention is the providing of an efficient means of pressing and thereby securing the perfect and smooth adhesion of photographs and scraps, or small pictures to the surface upon which they are to be mounted, and of doing so effectually and with greater quickness in time than has hitherto been attainable.
>
> My invention consists in constructing a frame of metal, wood, or any suitable material so as to have two points or bearings to carry the axes or shaft of a pressing roller. To the exact shape of this frame I do not confine myself; but in all cases I provide it with a handle or lever to assist the operator in the use of the roller for applying the pressure. The pressing roller may be constructed of wood, india-rubber, gutta percha, or any other similar suitable material. It carries as hereinbefore stated an axis or shaft, or axes or shafts, or pins upon which it rotates, and the axis or shaft passes into the bearings hereinbefore named. The pressing roller has around it by preference a cover of vulcanised india-rubber, which fits it or renders it by its elasticity more particularly applicable for the purposes indicated in the title of this invention.

We desire to add to the above a brief note to the effect that the roller here described, and which may either be procured cheaply or easily constructed, answers in an admirable manner as an inking roller for photo-collotypic printing. A specimen we received for applying to its legitimate purpose of mounting photographs was diverted from such use to that of an inking roller, and in this latter capacity it proved exceedingly useful.

RETOUCHING DESK.

MESSRS. BURROWS AND COLTON'S improved retouching desk is now well known, owing to its having been publicly exhibited on various occasions, and from being, moreover, in general use. The very effective manner in which it meets every requirement of the photographic retoucher has already been noticed in our article on the subject in our volume for last year. In our former article, however, we dealt with the retouching desk merely as a piece of useful apparatus; in the present one we introduce it as an art-implement for which has been secured the protection of a patent.

From this point of view we proceed to describe the distinctive features of the invention, and show in what consists the various improvements over pre-existing retouching desks. These comprise:—

1. A series of screens of varying degrees of transparency whereby the operator is enabled to regulate his labour according to the amount of care intended to be bestowed on the negative, the screen serving to temporarily conceal more or less, according to its degree of transparency, the minor imperfections in the negative, leaving only the grosser defects visible, so that the attention of the operator is confined to the faults which it is desired to remove, and is not distracted by the small imperfections which, the price being low or from some other cause, it is not worth while to correct. A mechanical selection is thus made which is a great assistance to the operator, who is, moreover, enabled to judge exactly the effect which his work will produce upon the finished picture. The screens consist of plates of glass of different degrees of density fitted in openings in a disc pivoted to the under side of the carrier on which the negative is mounted, in such a position that any one of the screens can be quickly made to coincide with the opening in the rotating carrier over which the negative is fixed.

2. The negative is secured by clamps in a circular carrier fitted to rotate in the desk, so that the operator can vary the position of the

negative to suit his convenience as the work proceeds, without having to remove the negative or to make use of any portable frames or appliances, as with desks now in use. The clamps are furnished on the under side, and are fitted with india-rubber cushions to ensure immunity from the risk of breaking the negative when the clamp screws are tightened up, and the clamps are fitted to slide in dovetailed grooves so as to be readily adjusted to the size of the negative.

3. In the employment of a concave reflector mounted upon adjustable supports behind the desk so as to be readily adapted to suit the direction of the light. With this reflector may be combined a lamp for night work, a plate of optical violet glass being in this case fitted in the revolving carrier to stop the yellow rays proceeding from the lamp above referred to.

4. The magnifier is so mounted upon a fixed standard at the left hand that it can be readily adjusted in any desired position to suit the sight without interfering with the right arm of the operator. Another advantage is that the magnifier being mounted on a fixed support it is perfectly steady, and the operator's sight is not impaired by the constantly-changing focus, as is the case when the magnifier is held in the hand.

Another improvement consists in a pencil sharpener fitted to slide within the desk, and consisting of a block on which a sheet of emery paper or other suitable abrading substance is stretched or clamped by a metal frame. This block draws out from the case in a convenient position at one side, and is retained by a spring which ensures its rigidity and permits of the emery paper or other material used being renewed from time to time.

As we have already given a drawing of this excellent retouching desk in our previous article on the subject (vol. xxiii., page 543) we need not here reproduce the two pages of diagrams by which the specification is illustrated.

The query put by Mr. Forbes in our issue for the 16th instant has revealed the existence of an unthought-of complication in connection with carbon printing, of which the adversaries of the process will not be slow to take advantage. Already three witnesses have appeared in our columns to show that solutions of the bichromates have injurious effects when applied to the skin, and these seem to be of such a serious nature that we purpose making an investigation into the matter to ascertain the proportion of subjects who are liable to feel the effect of this chemical, and to discover any prophylactic or remedy. We have recently had a conversation with a carbon printer of many years' experience; but the facts gleaned from him do not put the matter in anything approaching the serious light in which it is placed in the letters we have published. Asking him to be as exact as possible he assured us that he never felt any ill effects himself, though for months together he was occupied the whole of the day in developing the pigment pictures; and he also stated that he only knew a single case among his fellow-printers where any soreness of fingers or arms was brought about by such work, and in that one case the only result was a slight rash accompanied by considerable itching, no further or aggravated symptoms ever supervening. We think it is evident enough that much depends upon individual idiosyncracy, some subjects being liable upon very slight contact with the solutions to feel their injurious effects, while others can bear prolonged contact with them with impunity. Looking at the chemical composition of the salt, which is of an acid character, and which is easily decomposed under certain conditions by organic matter, we think the advice given by Mr. Foxlee "to wash the hands and arms with dilute ammonia, and to avoid letting any bichromate solutions dry upon the skin," to be excellent. Personally, we can bear witness to the readiness with which it enables visible stains of bichromate to be removed, and we always make an invariable point of using it when we have been applying Mr. M. Carey Lea's chromic-acid solution to our fingers to remove "pyro." stains. However, the serious consequences which might be produced in some cases have led us to take the matter up fully, and the result of our inquiries among manufacturers and others, as to the frequency of complaints of the action of this salt and the remedies used, shall be brought before our readers as soon as we obtain sufficient details.

Other occupation has compelled us for some time to relinquish our experiments with the hydrosulphite developer, but we hope to resume them at no distant date. We are glad, therefore, to find that M. Sammann is still devoting his attention to the subject, and call the attention of our readers to his communication in another column. The information therein contained promises to remove one great defect in that method of development, viz., the difficulty in obtaining sufficient density when using the ordinary emulsions now employed in this country. The organifier used by M. Sammann appears well calculated to produce the results claimed for it, as we can, from our own experience with the several ingredients when applied in other ways to dry plates, entirely corroborate the effects he describes in connection with them. Quinine we have frequently had occasion to mention as a powerful agent in restraining the action of alkaline pyro., and in preserving the clearness of the negative—functions which our experiments enable us to say will be found of very great value in connection with a hydrosulphite developer. Quinine unfortunately, cannot be used as an addition to ordinary alkaline pyro., owing to the fact that it is precipitated by alkalies, or we should have long since tried its application in that manner; nor, we imagine, could it be so used with the hydrosulphite of soda, hence we may greet M. Sammann's adoption of Mr. Brooks's method of organifying the plate previous to development as a peculiarly happy suggestion. The action of catechu when employed as a preservative is similar in character to tannin, but perhaps more decided, and the colour of the image partakes of a yellowish tinge rather than the brown-black which characterises the latter. For the special reasons stated in our correspondent's communication it has the advantage of tannin for the purpose described. We have no immediate means of ascertaining the strength of the French officinal tinctures of quinine and catechu (if such be intended to be used); but the corresponding English preparations contain respectively eight grains of sulphate of quinine and forty grains (nearly) of catechu in each ounce of tincture, combined in the one case with orange and in the other with cinnamon. If it be desired to employ M. Sammann's formula without the last-mentioned foreign principles it may be taken as consisting of one-sixth of a grain of quinine, fifteen grains of catechu, and two and a-half grains of sodic hypophosphite to each ounce of water.

THE NITRATE BATH: ITS DEFECTS AND RESTORATION.

[A communication to the Photographic Society of Great Britain.]

The treatment of the nitrate bath has so often formed the topic of discussion in the photographic journals that it would appear a task of some difficulty to say anything new upon the subject, and it is rather with the view of collating the scattered items of information than of contributing fresh matter that I venture to introduce the subject once more to the notice of the members of this Society. My effort has been chiefly directed to the examination of certain deposits, kindly furnished me by Mr. H. J. Burton, of the Autotype Company's Works, and by Mr. Frederick York, in the hope that the chemical results arrived at may point to the origin of some, at least, of the defects encountered in working on a large scale; for it is manifest that the more limited operations of the amateur do not offer the chance of so fully disclosing the nature of the changes brought about in the process of sensitising the collodion plate.

Before specifically describing these results I propose to remind you briefly of the chemical reactions involved, which may be stated somewhat as follows:—Collodion composed of one or other of the known qualities of pyroxyline, dissolved in ether and alcohol and sensitised with the bromides and iodides of potassium, ammonium, or cadmium, is, after partial evaporation of the air, brought into contact with an aqueous solution of silver nitrate, charged nearly to the point of saturation with the bromide and iodide of silver, whereby a sensitive coating of bromo-iodide is formed within the texture of the collodion film, and this remains moistened with the excess of bath solution. By repeated employment it is manifest that the bath becomes in time *fully* saturated with the haloid salts of silver, and contains, besides considerable quantities of alkaline (or cadmium) nitrate, together with ether and alcohol, certain extraneous matters derived from impurities in the iodisers employed. Beyond these we may now expect to find traces in the bath arising from the use of certain "organifiers," which are often intentionally prescribed as helps to sensitiveness when the plate is being exposed in the camera.

All goes well for a time; but after a longer or shorter interval these secondary compounds accumulate, and begin to exert their special action upon the plate, particularly when, by frequent use, the proportion of silver becomes sensibly reduced. For every plate immersed an amount of potassium (or cadmium) nitrate equivalent to the salts of silver removed must inevitably be left in the bath, with, also, increasing amounts of ethylic compounds and other organic matters. Hence has arisen the recommendation to use two or more baths in succession to overcome the disturbances induced by the first immersion, and I cannot see any valid objection to this mode of working. Mr. J. Brier, Jun., proposed such a plan in the *Year-Book of Photography* for 1876, and there are earlier suggestions to the same effect. By the slow, oxidising action of silver nitrate upon ether and alcohol, acetic and glycollic acids may be formed; also, possibly, oxalic, picric, and fulminic acids may exist or be generated from certain organic impurities present in the pyroxyline of the collodion. Mr. Warnerke tells me that, two years ago, he met with a remarkable instance of the formation of fulminating silver in the nitrate bath; but none of the deposits I have recently examined show the least indication of detonating properties. Mr. York, Mr. Brooks, Mr. England, and others have recorded the occurrence of explosions happening during the process of evaporation to dryness or subsequent fusion in order to recover the silver from an unserviceable bath; but we must remember that deflagration may always be looked for when silver nitrate is fused with any kind of organic matter, and in some instances glycerine may have been intentionally added to the bath during a period of unusually hot weather, and this circumstance, afterwards forgotten, might give rise to an explosion when the attempt was made to recover the silver by fusion. I have looked carefully for oxalic acid, but never yet found it, although acetic acid, and possibly aldehyde and nitric ether, must occur as oxidation products derived from the ether and alcohol. These bodies give rise to the peculiar smell always apparent in a well-used bath.

Another circumstance, which recent examination has fully demonstrated, is the frequent occurrence of sulphate of silver as a bath deposit—a fine example of which has been sent to me by Mr. H. J. Burton. It is in the form of feathery, needle-shaped crystals, almost insoluble in water, and separating out whenever a strong nitrate bath containing it is diluted with water. Its origin may be traced, first and foremost, to the iodide and bromide of potassium employed in the collodion; for these salts, as found in commerce, almost invariably give a precipitate with barium nitrate, due to the presence of alkaline sulphate as an impurity. Or, secondly, the sulphate may be introduced with the silver, especially if worked from residues containing sulphide, the metal from which, when acted upon by nitric acid, must necessarily give sulphate. Properly-refined silver should not retain any sulphur; but, unless the silver from residues be fused with nitre, I have often found sulphide of silver in the bottom of metal reduced with alkaline carbonates alone, and I am inclined to believe that the presence of gold (so common in photographers' residues) favours the retention of the sulphur. Mr. A. L. Henderson must have been aware of this general occurrence of the sulphate of silver when recommending the addition of nitrate of barium to the bath solution, and all testimony agrees in approving the use of this chemical agent as an addition to the bath which is calculated to overcome at least one fertile cause of pinholes. The late Dr. Maidstone Smith reported highly of it a year ago.* Mr. York now uses it, and several operators have recently recorded their experience in the same terms.

Much curiosity attaches to the startling proposal of Mr. Henderson to add also ferrous nitrate to the bath. This has not been done since Mr. Fox Talbot used for special rapidity an iodide of iron collodion, which necessarily introduces ferrous nitrate into the bath; and it would now be important to know more exactly the proportion of iron to be employed. Mr. Henderson's formula in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, 1877, is somewhat indefinite on this head, two drachms of a "solution of nitrate of iron" being prescribed for a fifteen ounce bath, with ten grains of the barium nitrate added. When making experiments at Woolwich some years ago I was astonished to find that the reducing action of ferrous salts was after all very imperfect, for it was possible to expose mixed solutions of iron and silver to sunlight for many hours without complete reduction being effected. Always some silver remained in solution side by side with the ferrous salt, and with the knowledge of this fact I think the new suggestion well worth a trial.

Another method of clearing the silver bath when it begins to show a disposition to form pinholes is to treat it with a very weak solution of pure cyanide of potassium. Mr. A. Borland gave exact details in the *Year-Book* for 1876, and Mr. H. J. Burton has carried out the same idea with good effect. One of the silver deposits obtained in re-working a bath at the Autotype Company's establishment consisted mainly of the cyanide of silver in beautiful nacreous crystals, and this led me to inquire whether such a process had not been employed, when Mr. Burton kindly replied that he had often used cyanide of potassium, as he "finds it improves the sensitiveness of the nitrate bath, and gives negatives of great delicacy." Here, again, we have an instance of a mild reducing agent being added directly to the bath solution, giving rise to the precipitation of a small quantity of cyanide which carries down with it the excess of iodide of silver. In the early days of photography M. Le Gray used cyanide of potassium in the waxed-paper process as an addition to the iodising salts, but much in the same way that the fluoride was prescribed, which we now know to be altogether inoperative; the idea seems to have emanated from the desire to mix up together all the haloid salts of silver on the chance of the best results being obtained by one or other of the many possible combinations.

The mode of sunning the bath with or without a trace of chloride cannot be made available in the winter season, and there is then the acidity to be corrected. A good account has been given of the method of partial precipitation by citric acid or an alkaline citrate, which is said to carry down with it the excess of argentic iodide; but this mode of proceeding I have only used in connection with the printing bath, where it answers admirably. For restoring a disordered negative bath the common practice is, as we all know, to dilute the solution with an equal bulk of distilled water, filter off the precipitated iodide, and make up the strength again with fresh crystals of nitrate of silver; but this process defers only for a time the evil complained of, and is not considered an altogether effectual remedy.

The general conclusion which blends best with all the recorded facts would seem to point to the use of potassium cyanide, added in quantity sufficient to produce a permanent precipitate in the solution, and then to add barium nitrate in slight excess, so that all the sulphate and excess of iodide may be removed in one filtration. If cyanide of barium could be had commercially a solution of this salt, containing within itself the necessary ingredients, would at once accomplish all that is desired to bring about the rectification of a disordered bath. JOHN SPILLER, F.C.S.

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SWING FRONTS AND HOW TO SWING THEM.

IN the catalogues of cameras and photographic apparatus issued by two or three of the leading London firms, "improved Kinnear's cameras" are quoted, "possessing all the advantages of a swing back." The advantage—if advantage it can be reckoned—is effected simply by allowing the front which carries the lens to be inclined backwards to any required angle, and there retained by means of a brass strut or support and clamping screw.

Now, I conceive it matters little whether you swing the front or swing the back so long as you follow the "looking-glass" principle, and retain the axis of the lens as the centre of the curve, in which case only the upper or lower portions of the focussing-glass are altered as respects distance from the lens.

But the case is very different when the hinge of the front of the camera carrying the lens becomes the centre of the curve, for in this arrangement the whole surface of the screen becomes affected, no portion of it retaining its original distance from the lens; and however well you may manage to include your subject on the screen without tilting, the result, nevertheless, is not satisfactory. To obviate this disadvantage I propose the following simple remedy, which may be applied to any Kinnear camera with very little trouble or expense:—

Detach the camera front and remove its hinges. Shorten or remove a portion from the bottom of the front—as much as you may think necessary. Provide a couple of stout brass supports, one on each side, reaching from the extending base-board (to which they must be hinged) to about four or six inches above the centre of the front, where they must be slotted for two inches below and four inches above the centre to allow the front to rise and fall, when needed, to that extent, and the front swing on them by means of brass arms or gimbals furnished with a screw or clamping adjustment to keep the front inclined to any angle and height desired. The diagonal supports are fixed by their own clamp in screws. This completes the arrangement. SYNTAX.

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* *Year-Book of Photography*, 1876, page 67.

DEFECTS IN CARBON PRINTING AND THEIR REMEDIES.

Dr. Liesegang has published in *Le Moniteur de la Photographie* the following compendium of faults of carbon printing and their remedies:—

The pigmented gelatine dissolves in the bichromate bath. This happens only in hot weather.——When the temperature of the bath is too high it may be cooled by transferring into it some pieces of ice.

In drying the gelatine liquefies.——Dry the paper in a cool atmosphere. In removing the tissue from the bath it should be lifted with a glass rod, and placed, dark side lowermost, on a plate of zinc. A sheet of india-rubber cloth is now superimposed, and a squeegee applied to remove the water.

In removing the paper from the glass it is found covered with dust.——This arises from the glass being imperfectly cleaned.

The dried tissue is too hard, and does not come into sufficiently close contact with the negative.——It has been dried too quickly and in too high a temperature; it must be left for some time in order that the action of the atmosphere may make it pliant.

The tissue adheres to the negative.——It must be moistened. If the paper be very hygroscopic coat it with dilute collodion and leave it to dry.

The wax on the surface of the glass is dull.——The glass is too cold, the wax is impure, or the pad has been wet.

After having applied the damp paper (after developing) on the class, it will be noticed that there are air-bubbles.——Leave the paper a little longer in cold water, and place very carefully on the glass, and any few bubbles that remain can be removed by means of a squeegee; but if there are a great number it is better to remove the tissue and apply it anew.

The tissue does not adhere to the glass, except at the edges.——This happens if the paper has been in the cold water bath too long, or if the bichromated gelatine decompose by age or by an impure atmosphere. In the first case it might prove sufficient to place a heavy glass on the tissue and leave this for five or ten minutes. In order to be certain of the tissue it is best to try the following plan:—Take a small piece that has not been submitted to the action of light, and immerse it in hot water; if the gelatine dissolve the paper is good. If it repulse the water it is decomposed. This defect, however, is of rare occurrence with newly-sensitised tissue.

The film becomes very quickly insoluble.——This happens both in hot and cold weather. To prevent this add to the bichromate bath one per cent. of carbonate of soda, and leave it in a current of air for four or five hours.

In the hot-water developing bath the tissue will not detach itself; the proof is not well developed, it being too dark.——The exposure has been too long; it has also been over-developed. Try more hot water or a bath of carbonate of soda two per cent.

The paper tissue detaches itself too quickly, and the proof is not of sufficient density.——Insufficient exposure; develope in water not quite so hot as usual.

After plunging the tissue with the glass in hot water, air-bubbles appear on the surface.——The water is too hot; commence with colder water, and gradually raise the temperature as it is found necessary.

The collodion detaches itself with the proof.——The film of collodion was too dry when it was plunged in the cold water, or the water has been too cold.

The collodion splits.——It is too tender or too cold; add a little negative varnish.

The proof is spotted or cracked.——The bichromate bath has been too hot or too concentrated, or the tissue has remained in it too long.

The proof is reticulated.——The tissue has been put into the hot water too soon after being applied to the glass; it should have been left for a few minutes in order to come well in contact with the surface. This defect also appears when the tissue has been dried too quickly in too high a temperature.

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NOTES FROM THE NORTH.

In the search for something interesting to the readers of The British Journal of Photography my peregrinations have recently extended a good deal further north than usual—as far, in fact, as Aberdeen, the "granite city," as its inhabitants, with not a little pardonable pride, like to hear it called. There are some cities which to the visitor are at first sight disappointing, and it is not till they have grown upon him that he fully realises their beauties and advantages. But it is not so with Aberdeen; a few revolutions of the carriage wheels transport the visitor from the railway station to Union-street, where the peculiar characteristics of the city burst upon his view. This street is as straight as an arrow, extending almost as far as the eye can reach, and flanked on either side by buildings which, both for architectural design and solidity of construction, are equal to anything to be found in most of the cities that I have visited. More striking, however, than the architecture or the stability of the houses is the greyish-white colour that everywhere presents itself, and which, from the clean, fresh appearance it gives conveys the idea that the stones have just left the dressing-tools of the mason, and that the whole city must have been constructed with a rapidity that would put even the rapid growth of the Western American cities to the blush, and makes it difficult at first to believe that the ignorance of the Southern is not being played upon when he is gravely told that many of those beautiful mica-spangled granite walls have, untouched, withstood the elemental war of half-a-century.

A second characteristic, which also very soon manifests itself, is the high degree of laudable pride which the Aberdonians feel in their city, and the equally large amount of satisfaction they have with themselves—a feeling that is highly commendable, as it urges them on to show not only to themselves but to the outside world that they fully deserve it. The result is that, though Aberdeen cannot be called a manufacturing city, whatever it undertakes it does well, and that whether it be granite monuments, preserved meat, or horn combs, it launches them forth in larger quantities, and probably also of better quality, than perhaps any of its competitors. Of course this well-directed energy does not go without its reward.

> "Something begun and something done
> Has earned a night's repose."

I don't suppose that is exactly what Longfellow wrote, but it will serve my purpose. Aberdeen, more than any place of its size and character with which I am acquainted, is in a healthy, thriving condition. Whole streets of handsome villas are being erected in the immediate suburbs, and society generally has a *tone* more frequently aimed at than realised.

As was to be expected, where all is so well done photography has not lagged behind. The inhabitants know something about good work, and take care to get it; as a consequence, the specimens in the show-cases, where show-cases are to be found, and they are not by any means in general use, are decidedly above the average. In the front, of course, comes Mr. George Washington Wilson, whose initials "G. W. W." are familiar to lovers of photographs in every part of the civilised world. Mr. Wilson—or, to speak more correctly, Messrs. George W. Wilson and Co.—carry on, probably, the largest photographic business in Scotland; and as I was privileged while in Aberdeen to minutely examine their establishment in all its departments, a brief account of it may interest the readers of the Journal.

At page 524 of the volume of the Journal for last year, there appeared a short description of the then recently-erected establishment at St. Swithin's; but as both plant and operators are now in tolerably perfect working order, my readers will bear a little repetition for the sake of such hints as may come from a fuller recapitulation of the work actually in hand.

Although Mr. Wilson is best known through his landscapes, like nearly all photographers he began with portraits, selecting, exactly a quarter of a century ago, Crown-street, near the centre of the city, as the site of his operations. But so little faith had he in the success of the venture that he then devoted considerable time to the brush. In fact, the same want of faith would seem to have been to him for a considerable period a kind of stumbling-block, as long after that he built on each side of the Crown-street premises large blocks of substantial stone edifices, while a wooden front was thought sufficiently good for the photographic department. At present the Crown-street establishment is devoted almost exclusively to portraiture, and is presided over by one of Mr. Wilson's partners, Mr. Gearing. Being of a temporary character from the beginning it has been re-arranged from time to time to suit the requirements of a growing business, and consequently has a somewhat straggling appearance. It is, however, very convenient, and includes two glass houses, and a flat roof for very rapid work. On the latter I saw a group composed of a pretty Scotch terrier and a prettier Prince Charlie successfully taken in a fraction of a second.

When business had increased to such an extent that the premises in Crown-street became too circumscribed, the printing was transferred to an old distillery a short distance from the city; and still more recently, when the ground was required for "feuing," the distillery was pulled down and the St. Swithin's establishment erected, which occupies an area of 180 feet by 84 feet, and contains separate apartments for almost every branch of the business, fitted up in the most perfect way that a lengthy experience could suggest.

Curiously enough, the same want of confidence in the stability of photography as a trade, as already noticed—or, it may be, prudent forethought looking far ahead—has been shown at St. Swithin's. The front building, which at present stands almost alone, but which will by and by form a unit in a fully-constructed street, is in external form precisely that of a substantial dwelling-house, and the arrangements of the building are such that only internal alterations would be required to convert it to that purpose.

On entering by a capacious gate—which, but for a large plate with the words "G. W. Wilson and Co.," might easily be mistaken for the entrance to the coach-house and stable—the visitor is brought face to face with the enlarging house, autotype enlargements being a branch recently added—not of their own work merely, but for the trade generally. The enlarging house measures 48 feet by 36 feet, and is unequally divided into two apartments. The outer division is fitted up for the purpose of cleaning and albumenising the plates, and contains the only open fire that I saw in the establishment, all the other departments being well heated with hot-water pipes. One "wrinkle" I saw here may be of use to those who get air-bells in the albumen when pouring it on the plate; it was the use of an ordinary teapot as a pourer, and it answered admirably, plates of the largest size being coated with great ease. The inner room is practically the camera, and measures about 20 × 15 feet. Close up to a square opening in the end wall is firmly fixed a wooden tube about four feet in length, and fifteen inches square, with a slit near the wall to hold the negative or transparency carrier, between which and the inner end of the tube the frame-work carrying the lens slides easily. The light is obtained by reflection from a mirror situated outside the wall immediately opposite the opening, and placed at a suitable angle. The focussing-glass and, afterwards, the prepared plate are placed by a simple arrangement in an upright frame firmly fixed to a small bench on four wheels, which run in grooves in the floor. In this way the plate is always "square on," and the necessary adjustments are simply made. The frame-work carrying the lens, inside the wooden tube, is worked by two cords which reach beyond the platform, so that without moving from the spot both size and focus can be obtained. With this arrangement I saw the operator in that department coating, exposing, and developing plates of 36 × 28 inches with apparently as much ease as I could manipulate a 12 × 10 plate.

Crossing the open space we enter the front building, stepping at once into a large room devoted altogether to carbon or autotype work, and the first thing that strikes the uninitiated is the large quantity of white light that the presiding genius of this department knows may safely be used in the manipulation of the tissue. It is cut, put into the frames, prepared for transfer, &c., on a table in the centre of the room, with an upright stretcher covered with buff calico fastened to the side next the window. The fact seems to be that, however sensitive the tissue may be to strong light, it is very little affected by that which is feeble, and not at all while it is wet. Round two sides of the room are fixed half-a-dozen wooden tanks about five feet square—some of them lined with galvanised iron and others plain, but all supplied with both hot and cold water. These are used for transferring, developing, and aluming, and are apparently sufficient for a large trade.

A door from the above room leads into a large apartment presided over by another partner, Mr. Smith. It is at once stockroom and office, and contains on its capacious shelves probably a larger number of photographs than it has been the good fortune of many to see brought together. They are kept—each variety by itself—between millboards, and so perfectly registered that, notwithstanding the thousands of subjects, no difficulty is experienced in finding any particular one that may be required.

The flat above is mainly occupied by one room the whole length of the building, in which the cutting, mounting, and rolling is carried on. Here I saw presses of various construction in use—some heated and others used cold, but all with plates and rollers, burnishers having been tried, but discarded as not so satisfactory.

Everybody recognises the value of experience as a teacher, and so in an establishment where for so many years such large quantities of good work as been done every little atom of information may have its value. "What is the best mountant?" is often a question somewhat difficult to answer. What I saw in use here was an alcoholic solution of glue of such a consistence that when cold it formed a stiff jelly. It may be made as follows:—Soak (say) half-a-pint of good Scotch glue in a pint of water for twelve hours, pour off the water, and submit the swollen glue to a gentle pressure in a cloth. Then put it into a basin and add sufficient methylated spirit to cover it. Place the basin in the mouth of a saucepan of boiling water, and continue the application of heat till the glue is dissolved. When nearly cold add a drachm of oil of lavender to cover the odour of the spirit, and the operation is complete. Too little spirit will leave the mountant too stiff, and too much will make it too thin.

On the same floor there is a well-lighted room furnished with all the necessary appliances for finishing the enlargements in black and white, and contiguous to it an apartment devoted to the drying of sensitive tissue. The temperature of this room, which, like all the others, is warmed by a very perfect system of hot-water pipes, can be varied at will by the action of certain taps, so arranged as to bring either few or many of the pipes into operation.

Lastly, so far as this building is concerned: there is a room devoted to spotting and retouching, in which I found a number of both male and female hands employed. But I suppose I have written sufficient for one article, and had better leave a description of the printing, washing, &c., and the several useful "wrinkles" connected therewith, till next week. JOHN NICOL, Ph.D.

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PHOTOGRAPHY IN COLOURS.

IN our *Foreign Notes and News* we have frequently made allusion to a process of photography in colours invented by a French chemist, M. Ducos Duhauron, of Agen. For this invention M. Duhauron has obtained a patent, and we rise from a perusal of the specification with the conviction that never, since a photographic patent was first granted, has there been one whose specification can compare with this as respects length and comprehensiveness. To curtail it, or to make any synopsis of the document, we shall not here attempt, preferring to place it before the reader in all its fulness. There are certain passages which seem to be a little obscure, but we have the satisfaction of knowing that the patent agent through whom the English patent has been obtained, Mr. William Morgan-Brown, is a gentleman of great experience, not only in connection with photography, but in Franco-English patent law; hence we append the specification, which is a veritable treatise on the subject of heliocromy, without any further comment.

GENERAL DESCRIPTION OF THE SYSTEM.

THE problem of photography in colours such as I express it does not consist in submitting to the luminous action a surface prepared in a manner to appropriate and preserve at each point the colouration of the rays which strike it. What I ask is that the sun avails itself judiciously of an invariable palette, to which it is trusted. It must be that he only charged with the choosing and the mixing of the colours furnished to him will obtain incomparable copyist the most learned and the most authentic of the representations of nature. The problem being defined in these terms, an observation that I have checked by numerous experience has served for the point of departure to resolve it. That observation is this:—In opposition to the colours of the spectrum, the scale of which is formed of innumerable shades, and allows of our distinguishing and naming seven principal ones, the colouring substances which serve to express them are reduced to three—red, blue, yellow. This triplicity of colours has been of long date experimentally but confusedly recognised; if it had been verified beyond possibility of doubt it would have long since been an axiom if, in place of making the mixtures with the brush, the molecular mixtures of these three colours (an operation which leads to trouble and disorder in the results) the painters had been led, as I have been, to accomplish the optical mixture—the only one which should be perfect—they would have affirmed that which they announced timidly, viz., that three pigments, red, blue, and yellow, mixed in divers proportions, produce all the shades. In other terms, if there are applied one upon the other, and on a white ground, three transparent sheets or pellicles, one red, one blue, one yellow, on each of which the colouring matter has been spread in variable thicknesses, the superposition of these three layers of colours, the intimate and mechanical adaptation of the one to the other, gives rise to the infinite variety of known tints comprising all gradations from black to white. This point of departure thus fixed, I will explain by what reason I have arrived at this system of heliochromy. If it is true that three colours produce, by the mixture which results from their superposition, all the colours, it follows, per contra, that any picture—that is to say, a surface formed of the assembling of all the colour, or from the assembling of a number more or less of colours—may in the mind decompose itself into three pictures, the one red, the other blue, the third yellow, the superposition and the incorporation of which reconstitute the same picture. This analysis and this synthesis that the mind accomplishes so easily, is it or is it not in the power of photography to produce in reality? If it has that power the problem of photography in colours is solved. Interrogated in this fashion, and forced to explain herself, Nature has replied, Yes. My three pictures, the one red, another blue, the other yellow, have passed from the domain of theoretical speculation into palpable reality. Photography has delivered them to me, and I have only had to accomplish by manipulation the superposition and unification to see born immediately the copy, *par excellence*, the integral polychromatic representation of the model.

To attain these results the difficulty one may imagine did not consist in the printing in red, in blue, or in yellow the work of light; in one word, to get the positive images of any one of the three colours (for a long time practically, thanks to the discovery of M. Poitevin, we have photographs in colour by the interposing *clichés* monochromes of any shade at the wish of the operators), but to dispose and manage the things in such a manner that upon each of the three monochromes, and in the first place, on each of the three *clichés* (negatives) which should furnish them, the sun should distribute with the characteristic difference of repartition which it should have between them the black matter of this one, the coloured preparation of that one; that was the very knot of the question. I have mastered it by an optical combination, of which the announcement would seem at first paradoxical. This is the way I proceed:—I obtain separately in the camera three impressions, three negatives of the same subject, furnished by three different lights, green light, orange light, and violet light; I make the red monochrome under the negative which is given by the green light, the monochrome blue under the negative from the orange light, the monochrome yellow under the negative from the violet light. Why these three lights, and why this intermixture, this (*chassé croisé*) interchange of the colours? This is the reason, at least a brief explanation, for there is in this a vast field of inquiry for science:—Each of the three monochromes being formed by a preparation endowed with transparency, and susceptible of being fixed by the action of the light, and proportionally to that actions each of them, by the fact of the interverting of the colours above specified, will necessarily give either as gradation of lights and shades or as a repartition of the special colour of the objects the desired image. And first, as to gradation of the lights and shades, leaving out the special colour of the objects to be represented, each of the three monochromes will be evidently exact, each of them in effect being furnished by a negative (*noté*) which gives the blacks of the object by white, and the whites of the model by black, will give in its turn the blacks of the model by the preparation, red, blue, or yellow, proper to that monochrome, and this red, or this blue, or this yellow will be as much more intense as the black of the model is more black, and reciprocally each of them will give the whites of the model by the absence of the colouring matter, that matter being eliminated under the blacks of the negative, and as much more eliminated as the white of the model will be more white.

Note 1.—The employment of negatives is supposed here, which is the most common case, but positive *clichés* might be used if they were obtained by the preparation employed to produce the monochromes. This takes place notably for the hygroscopic mixture of sugar and bichromate; the reasoning is alike in both cases.

In the second place, as repartition of the special colour to the objects which it is required to represent, each of the three monochromes will be not less exact, and it is this repartition which will engender from one monochrome to the other the differences they should offer, and which will not arise by simple transfer of the lights and shades. I take, for example, the monochrome red supplied by the negative which is due to the green light. As the glass of the green colour which filters that light intercepts the red rays emitted by the model, and contrarily lets pass the rays which range from the green, the blue, and the yellow, it results that the negative in question translates the red surfaces of the model by white, and gives the black for the surfaces green, blue, or yellow, that the red preparation of the monochrome given by this negative will translate the reds of the model by red, and by a red as much more intense as the red of the model shall be more pure; that, lastly, the same red preparation will be eliminated under the blacks of the negative—that is to say, in the parts of the above-mentioned monochrome which correspond to the surfaces green, blue, and yellow, and that this elimination will be as much pronounced as these divers colour differ farther from the red. An analogous reasoning will apply to each of the two other monochromes; they will contain the one and the other a faithful repetition of the colour, whether simple or mixed, that they are intended to represent.

The superposition of the three monochromes adapted mechanically the one to the other and placed on a white ground produce the composition the polychromatic image desired.

It happens in effect that on the white ground the transparent colours of the three monochromes in mixing together two and two in divers proportions give rise to the binary colours; that is to say, oranges, greens, and violets, and all these, by mixing themselves in divers porportions, partially extinguish themselves and give rise to shades—that is to say, deep grey colours, browns, and black, whilst the white arises from the simple absence of the colouring matter on each of the three monochromes.

The known processes of photographic printing in colour of which I have spoken as applicable to the three monochromes are no other than the coloured bichromated gelatine, and all methods similar or derived from it, such as the photoglyptic (Woodbury), the impressions in fatty inks, photolithography, photographic enamels, &c.; there are also the printed proofs founded on the use of perchloride of iron in place of bichromates, &c.

The three monochromes may also be obtained chemically; for example, by means of three sorts of transparent colouring (*virage*) (toning) laid upon three proofs made with the salts of silver.

I have employed purposely the expressions green light, orange light, violet light, substituting them for the designation that I used at first, for the three sorts of coloured glass, by the interposition of which I have up to this time produced these three lights.

In effect the employment of three coloured mediums, of three glasses for example, has nothing absolute, nothing which ought necessarily to enter into the definitions of the system, and one may imagine that by the effect of certain preparations exclusively sensible to such or such group of the rays of the spectrum, the printed surface might be able (without the assistance of any middle colour intercepting the other rays) to receive the same impressions that it would receive with the interposition either of a green-coloured glass, or an orange glass, or a violet glass. That possibility is at present changed into certitude, as I shall establish in the course of this memoir, for those of the three sensible surfaces which correspond to the violet glass, the greater part of the photographic preparations that it allows of gives the same prints whether we maintain or suppress this glass, the same rays exerting this action in the two cases to the exclusion of all the other rays.

To sum up, chromophotography such as I have imagined it, and such as I propose, may be defined the act of transferring separately by three images, the red, the other blue, the other yellow, the image of the camera by means of the decomposition of the light in three lights, of which each offers the complementary colour of that of the image of which it furnishes the imprint, and to blend together afterwards these three monochrome pictures in one single picture, which is no other than the complete polychromatic representation of the model. This decomposition, this sifting of the light, is physical or chemical—physical when it is obtained by the employment of coloured mediums (coloured glasses, including the prism, &c.); chemical if it is produced by means of photographic preparations uniquely impressionable to the colours of such or such portion of the spectrum to the exclusion of the other colours.

(*To be continued.*)

Meetings of Societies.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The usual monthly meeting of this Association was held on Thursday, the 22nd inst., at the Free Library, William Brown-street,—the Rev. H. J. Palmer, President, in the chair.

The minutes of the previous meeting were read and passed.

The Secretary read a communication from Mr. Ellerbeck, in which that gentleman stated that since he read his paper at the previous meeting he had received from Mr. W. B. Woodbury a packet of his transfer paper, and found it admirable for the removal of negative films from ferrotypes and glass plates. Mr. Woodbury recommended, after the immersion of the film and paper under water, to squeegee the two and leave them for half-an-hour, then, while still damp, to remove the paper negative. Mr. Ellerbeck found this not possible in the case of metal, the collodion adhering strongly to the iron; but if the whole were thoroughly dried and, if necessary, heated, a knife passed under the paper separated the whole at once, and without the slightest difficulty. Care must be taken to have the ferrotype surface clean, otherwise a portion might remain in minute spots, which could only be removed by using ether.

The Secretary exhibited several transparencies toned with chloride of palladium. These were considered excellent, and the tone very satisfactory. They had been prepared by a solution of two grains of palladium to one ounce of water; but Mr. Ellerbeck thought a weaker solution would do.

The President exhibited some sheets of gelatine made thicker than usual, which he found very suitable for using as substitutes for glass to coat with gelatine emulsion. He (the President) had been using, for the purpose of coating, a simple apparatus, which, as they would see, was merely a sheet of tin doubled like a sheet of note paper, the upper half having an opening a little less than the paper or gelatine to be coated, and being bent a little outward, forming a spring when the two sides were pressed together, and for convenience clipped with the paper between; the emulsion could be easily spread with a glass rod, the paper lying perfectly flat. The tin holder should be slightly warmed before coating with gelatine. He (the President) also exhibited a folding three-sided lamp shade, one side having an opening covered with non-actinic gelatine.

Two portrait negatives of the President were shown, which had been kindly exposed by Messrs. Brown, Barnes, and Co. at one of their studios—one on a collodion plate, and the other on a gelatine plate prepared by the President. The former had an exposure a fourth longer than the gelatine; the result was slightly in favour of the wet collodion plate.

The President then proceeded to give a practical demonstration of Mr. Leach's enlarging process, which was watched by the members with the greatest interest.

The meeting was shortly afterwards adjourned until April.

Correspondence.

NOTES ON GELATINE EMULSION.

To the Editors.

Gentlemen,—As the yellow or orange-coloured stain produced in the gelatine plates prepared with zinc bromide is soluble in dilute hydrochloric acid, and as I have found that methylated spirit is not in any way to be blamed, I now have no doubt that it is caused by the alkaline developer, though why the films should be more liable to stain than others is more than I can discover.

I believe it to be a fact that certain bromides, in conjunction with the developer, tend to produce it, while others do not.* Mr. Weston, in a letter published on October 13th of last year, says that he has only met with red fog in plates prepared with cadmium bromide, and adds that the warmth of the hand during development is the cause. I have not traced the stain in the zinc plates to this cause; and, though I am continuing my experiments with the bromide, in order to elucidate some mysteries, I am afraid, however favourable in other respects, this liability to stain will be a great bar to its use.† If the plates are not too far gone a prolonged soaking in dilute hydrochloric acid will remove the stain.

My experiments as to the sensitiveness of zinc gelatine emulsions, prepared in the same manner, have been, and are, very perplexing. You will see, by referring to one of my late letters, that the zinc gelatine emulsions, made to test the addition of an extract of pyroxyline, were only about one-fourth as sensitive as the zinc collodion emulsion. At that time the emulsions were extremely thin by transmitted light, though capable of giving very dense images. After preparing a few plates with them I let the emulsions cool, and then poured a little ether on the surface of each, and laid them by for a few days. On returning to them again I was at once struck with the appearance of greater opacity in the emulsions when liquefied, and at first attributed it to some action of the ether, as this effect was not apparent in other zinc emulsions to which ether had not been added. I was also surprised to find that the gelatine had absorbed quite a quantity of the ether. I have not found other emulsions prepared in the same way, or, at least, with the same materials and proportions, to be affected to the same extent by keeping with ether or without, though all the emulsions appear to become slightly more opaque with keeping. It must be distinctly understood that these emulsions are supposed to contain nothing soluble, though it is possible that a trace of zinc nitrate may remain.

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* It is possible that an extremely fine film, by reason of its homogeneity, retains the developer with a much firmer grasp than is usually the case.

† Since writing the foregoing I have developed some plates which are free from the stain.

Plates prepared with the altered emulsions were very much more opaque than plates prepared with the emulsions when fresh, and I conjectured that the rapidity would be affected. In this I was right; the plates were five or six times as sensitive as those prepared with the fresh emulsion, and exceeded the sensitiveness of the zinc collodion emulsion, the same developer being used for all the trials. Plates prepared on different days seem to vary much in relative sensitiveness, and I am able to say nothing definite as to the exact benefit we are to expect from keeping the emulsion, or about the cause of the action set up.

If an alcoholic solution of gelatine be allowed to solidify it will be found that it no longer presents a semi-transparent appearance, but that it has become opaque and nearly milk-white. The same results if we add zinc bromide to the alcoholic solution—perhaps to even a greater degree, but of this I am not certain. If we add ammonium bromide to an alcoholic solution of gelatine the effect is quite different; the solidified gelatine remains in colour as if still in a liquid state. I account for this result by supposing the ammonium salts to have a dissolving action on the gelatine. I have for some time past noticed the rapidity with which gelatine swells in a cold solution of an ammonium salt. This peculiarity is particularly noticeable when gelatine is soaked in a mixture of alcohol and water to which ammonium bromide or chloride has been added. It will be found that the gelatine will have swollen to a great extent, while the gelatine which has been placed in the same proportions of alcohol and water, but in which zinc bromide has been dissolved, will hardly be sensibly affected. Here again, I think, we have evidence of the tendency an ammonium salt has to dissolve gelatine.

I think I see some connection between this dissolving effect and the comparative ease with which an alcoholic emulsion is made when the same has been prepared with *ammonium bromide* in excess. Still, the silver bromide may be precipitated in such an emulsion, and not the gelatine. The former re-emulsifies on the addition of water.

I have prepared another emulsion with ammonium bromide in excess, washed it, and evaporated it down to a pasty consistency. I then attempted to dissolve the gelatino-bromide in rectified alcohol, so that the emulsion should measure one ounce. The emulsion would only form when the alcohol was strongly heated, or, at least, the silver bromide was precipitated unless kept in this condition. Diluted with about a tenth part of water the bromide was precipitated when cold, and the gelatine, or, at least, the greater part of it, returned to a state of jelly, with a small quantity of alcohol on the top. The spirit seems to precipitate the bromide rather than the gelatine. The bromide was partly precipitated even with equal parts of spirit and water. And now, having succeeded in emulsifying the bromide, let us add a slight excess of silver nitrate; but previously coat a plate with the emulsion as above, and then add the silver and coat another plate. When the two plates are set it will be found that while the first is faultless—so far as the state of the bromide is concerned—the second is covered with little clots of silver bromide. If now we add sufficient ammonium bromide to convert the silver nitrate and prepare another plate, we shall get one identical in appearance with the first.

I do not know whether any of your readers besides Mr. Gray are able to make satisfactory alcoholic gelatine emulsions; but I think I can point out one method by which even plates could be obtained.

We want an emulsion which will neither precipitate its bromide when cold, nor form striæ on the coated plate. To this end we must not attempt to add too large a proportion of alcohol to the aqueous gelatine emulsion, and, in order to be able to use the emulsion cool, and thus avoid striæ, not more than about ten grains of gelatine to the ounce should be used. The proportion of silver bromide may be raised, it being desirable to coat the plates thinly. Use the emulsion as cool as possible with plates of the normal temperature.

Captain Kerr credits me with having exploded "the false notion that the most sensitive emulsions *must* be made with gelatine." Not so quick, though! At the most I have only "laid the train;" I have not done much more than the making of a proposition, and adducing arguments in its favour. I think the following may be taken as an axiom:—That generally, and under similar circumstances, gelatine will be found to produce greater sensitiveness than collodion, and especially so when working density is taken into consideration.

Again: that under special circumstances collodion may be made to produce as sensitive a plate as gelatine, as we commonly know it. Under these circumstances I make the proposition:—May not gelatine, also, *under special circumstances*, be made to produce greater sensitiveness than collodion produced under the same advantages? I believe that, as discoveries in emulsion work will probably apply to both forms of emulsion, gelatine will generally be found to be in advance of collodion in sensitiveness combined with density.—I am, yours, &c.,

Cotheridge Court, Worcester, HERBERT B. BERKELEY.
March 20, 1877.

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THE BARYTA BATH.

To the EDITORS.

GENTLEMEN,—My apology for addressing you on the "baryta bath" is this:—I am not a member of any photographic society. Some time since I sent in my resignation to both London societies in consequence of the cliqueism into which they had fallen; so I had not the opportunity of taking part in the discussion on the above subject.

Your contemporary evidently wishes to convey the idea that I claim having discovered all the properties of the baryta bath. When I read my paper before the South London Photographic Society (see THE BRITISH JOURNAL OF PHOTOGRAPHY, June 20, 1873), I stated that the addition of baryta was *not* new, and full credit was given by me, in an answer to a statement by Mr. Jabez Hughes, as well as in the discussion on my paper, to Dr. Vogel for first introducing this salt as a cure for sulphate pinholes.

If I have committed any error in following up Dr. Vogel's experiments, and in finding more advantages than he claimed, or that other nitrates, such as lead, answered the purpose, I ask that gentleman's pardon. One thing is certain: when I read the paper I could gain nothing by advocating this bath to the profession, unless it might have been an American degree of "M.A.," which it is well known America sometimes grants to those who, like the re-inventor of the collodio-chloride process, introduce old things under new names. But I am getting away from the subject.

It is strange that photographers should be over twenty years in finding out that streaks and stains in negatives principally arise from the inequality of density of the bath and developer, and that one of the best developers extant is as follows:—

Protosulphate of iron	2 drachms.
Common alum	4 ,,
Acetic acid	2 ,,
Gum camphor (broken up into small pieces in the bottle)	in excess.
Water	6 ounces.

This developer, when tested by the argentometer, will register about 30°. Should your readers use a stronger or weak ersilver bath than thirty grains the alum must be increased or decreased in the same ratio. I feel a sensation of vanity creeping over me in announcing this principle! Perhaps the idea has been published before, and perhaps I am wrong in letting this "wrinkle" out. I might "go on for ever" getting nice clean negatives without my brethren knowing how.

Returning to the subject of barytes: what, in the name of good sense, could your contemporary be thinking of to allow a valuable remedy to lie dormant for eleven years?

As I am not aware how journalism is conducted, will you enlighten me in regard to the following?—Is it usual for a publisher to submit advertisements to the editor for his approval after the publisher has accepted, taken payment, and given a receipt for said advertisement? Some time since this occurred to me, and all because I wished a complimentary extract from THE BRITISH JOURNAL OF PHOTOGRAPHY, concerning myself, advertised. The said publishers demurred about inserting the advertisement, and I had to threaten them before they would comply. Need I add that from that time I "cut" the editor in question.—I am, yours, &c., A. L. HENDERSON.

London, March 24, 1877.

[In reply to the above question: it is not usual in *this* office to reject advertisements on the grounds referred to above. We are not aware on what principles the admission of advertisements is regulated in the offices of other journals.—EDS.]

◆

CARBON PRINTING.

To the EDITORS.

GENTLEMEN,—I am very much puzzled at this time to know what is best to be done. I am desirous of replacing my silver printing by some more permanent method, and had almost decided to become a licensee of the Autotype Company, supposing a license was necessary; but this week I see an advertisement in your Journal from a company who are on the point of supplying the tissue and other materials for the working of the process, and I also see that a firm at Surbiton offer to teach me the Lambertype carbon printing process, and that *no license is required.*

I think, gentlemen, in the interest of your readers this matter should be somewhat cleared up. I see the Autotype Company still advertise their licenses, and this week they say they decline to supply materials except to licensees; but if it be true, as I have been told on very good authority, that the materials can be bought in the open market, this move of the company's is not likely to be of much avail. Altogether I am in a dead-lock. I think the company have not been illiberal, and that the price they put upon their license is not ruinous, but nobody likes to pay without the necessity being shown. If I can get all my instruction, work without a license, and buy my materials in the open market, I for one do not see the necessity.

Will you excuse my taking up your space in this matter? Of course I might have written straight to the company, but being unknown to them I felt disinclined to do so, and, besides, this seems to be a matter that really requires to be explained for the benefit of all your readers.—I am, yours, &c., J. Elliott.

125, *Liverpool-road, Islington, March* 26, 1877.

[We publish this letter as one representative of a class. With respect to the advertisement from "a company who are on the point of supplying tissue," it did not appear in *this* Journal, having been handed in too late for insertion in our last number.—Eds.]

To the Editors.

Gentlemen,—I have waited patiently to let everyone have their say regarding Lambert's processes. There has been the usual mixture of sensible remark and its opposite, and the strained efforts to bolster up a faith in silver printing has been perfectly ridiculous and funny. When you gave your readers an account of your visit to Lambert, at Greenwich (now two years ago), you said "permanent printing having now arrived at this stage we trust that, for the credit of photography and the honour of the profession, the production of fading photographs will shortly cease, and the standing opprobrium will be removed." Previous to this you had, like many others, when looking over your own productions, and the prized productions of others, when obliged week after week to read complaints, answer the queries of correspondents, and prescribe for measles, jaundice, blisters, faintness, and "fading away"—I say, like others, you had prayed for the time and the process that would deliver you from all this vexation and worry, and the abominable stigma of inborn corruption wiped out.

You did as every lover of the art ought to have done: you hailed the deliverer. But oh! these patents and license fees! Hitherto "nothin' 'as cost us nothin'," and every laggard has stood behind this poor plea, while the public are being educated to know that there is "a kind which don't fade" and are demanding to be served with such. Now, there is moving and signs of life among the dry bones, and we licensees "who have shown a tendency to elevate ourselves into a sort of sept," and "altogether walk in very tall boots," are beginning to feel that our position is not very firm. The "magic thirty pounds" will not protect us. "No license required," say Fry and Co., and a tissue-manufacturing company will be ready with a price list in a few days, and here I, in my innocence, have been scrupulously fulfilling the conditions of my license and refusing to oblige a friend by giving away a bit of tissue or enlarging a picture for him.

Gentlemen, can you tell what it means? Will the Autotype Company tell us what they mean?—I am, yours, &c., John Henderson.

Perth, March 27, 1877.

To the Editors.

Gentlemen,—Another grand field-day yesterday *re* the chromotype, &c., process. Mr. Avery, of Tonbridge, made objections to many points as regards facilities in accomplishing what can be done in silver printing. He has come all the way to Salisbury, and Mr. Witcomb has demonstrated before me that he is quite mistaken.

For instance: Mr. Avery wrote me some time since that he could not understand how clouds could be printed in separate from the picture. Mr. Witcomb had no cloud negatives, as he practises portraiture almost entirely. I therefore wrote to Mr. Avery to bring some of his own negatives, which he did. On this occasion we did not attempt extreme rapidity, as Mr. Witcomb was most generously anxious to explain and instruct as much as possible.

All the proceedings were similar to those I have described before. Mr. Avery's negatives were exposed by "the boy" (of course under Mr. Witcomb's superintendence) and treated by him, while Mr. Witcomb entered into various other little matters, as he was desirous to give his *confrère* as much information as possible during the short time he could stay.

As regards the clouds: Mr. Avery had the management of the printing-in. Both were novices in this matter, so far as carbon printing is concerned; so Mr. Avery did the work. The first print was quite successful; the second was underdone; the third was perfect. About half a tint was the time required.

I have not seen a better print for the subject than the last. It is a heavily-ivyed building. The details in the shadows are beautifully rendered, and the clouds are perfect. I mean, with due respect, to say that I have never seen such work done, with so much certainty and so quickly, in silver printing anywhere, either here or abroad.

Mr. Avery having been an extreme doubter is, I believe, quite a convert, and told me he should at once take out the full license.

Mr. Witcomb has only done about twenty silver prints during several weeks, and intends to discard it *in toto*.—I am, yours, &c.,

Harnham Cliff, Salisbury, March 26, 1877. Thos. Parkyns.

[It is pleasant to find a veteran artist like Sir Thomas Parkyns "go in" so enthusiastically for carbon printing.—Eds.]

THE HYDROSULPHITE DEVELOPER.

To the Editors.

Gentlemen,—Having purchased some Liverpool emulsion, on developing the dry plates prepared with it I met with the same difficulty as yourselves, viz., the negative refused to acquire the necessary density under the action of the hydrosulphite developer, but remained of a very transparent colour.

Availing myself of the suggestions contained in Mr. Brooks's paper on emulsion photography, I had only, in order to avoid this evil, to modify slightly the *modus operandi.* Now I can obtain with the commercial emulsion a negative as clear and as intense as those I prepare myself with Mr. M. Carey Lea's iodo-bromide unwashed emulsion, and this with an exposure shortened to the extent of twenty or twenty-five per cent. on the exposure given in the instructions.

The negative is flooded with alcohol as usual; then, instead of washing the plate with water, it is immersed in the following preservative:—

Water	12	ounces.
Tincture of quinine	2	drachms.
,, catechu	3	,,
Soda hyposulphite	½	drachm.

When the greasy lines have disappeared, drain and place the plate in the tray containing the hydrosulphite developer.

The hypophosphite produces two results:—1. The colour is changed to a more brown tinge. 2. The exposure is lessened. In the form of developer, as suggested by Mr. H. B. Berkeley, I have not been successful, but used in the way described it works well.

On changing the proportions of the quinine and catechu tinctures the character of the resulting *clichés* is altered—the quinine giving clearness, and the catechu promoting intensity.

I have no doubt that other preservatives would work well; but I prefer the one recommended for the facility it gives in regulating the action of the developer.

My reason for using catechu is that the tannin it contains does not precipitate the quinine salts, as the quercitannic or the caffitannic acids do.

Another fact I wish to bring under the notice of your readers is the possibility of intensifying a negative with chromic acid or with a soluble iodate. Mixed in small quantities with the pyrogallic acid developer, tanno-melanic acid (or a tanno-melanate) is formed. These substances are those which represent the last stage of oxidation of the alkaline developer. The difficulty is to manage the intensifier, the reaction going on very rapidly, easily producing stains and blocking up the shadows; this in a more marked degree than the alkaline developer.—I am, yours, &c.,

43, *Avenue du Bois de Boulogne,* L. O. Sammann, C.E.
Paris, March 11, 1877.

◆

"AN UNACCEPTED CHALLENGE."

To the Editors.

Gentlemen,—I understand that Mr. Kennett refuses to join me in offering a prize of £50 for the best dry plate. If he refer to your leading article of February 9, 1872, he will find that even then uranium dry plates were thoroughly fitted for use in the studio, and since that time their sensitiveness has been much improved.

To Mr. Kennett's questions—"Why talk of my process as a secret one?" "Is it not patented?" &c., &c., I am slightly surprised to find I can answer in the negative. It is not patented, the patent having become void by reason of non-payment, last year, of stamp duty. This question, therefore, is hardly compatible with Mr. Kennett's dissertation on "dignity," but is more of a piece with the vaporous boasting contained in his last two letters.

Colonel Wortley and Dr. Nicol have both clearly pointed out in your columns that the ideas of others had been appropriated and incorporated in Mr. Kennett's (then) patent. Whether on account of this, or of defects in the process, the fact remains—the patent is gazetted as "void." I enclose the *Gazette*.

After the queer repudiation, by Mr. Kennett, of any secresy, he curiously enough goes on to accuse me of wishing to obtain his process by my offering to join in giving a prize for the best *ready-prepared* dry plate. Now I ask you, gentlemen, how on earth could such a thing be? or was there ever a more paradoxical form of accusation?

I care not whether Mr. Kennett's is a secret process or not. In most commercial processes there is a "something" behind the scenes—small blame to the proprietor! But surely all this confusion on Mr. Kennett's part shows the cause of his final question, viz., why the purchaser of a formula should not divulge the secrets of his process (supposing him to have any) in the "interests of science." I answer—because it is not generally expected of him to do so by those who are wise enough to weigh the *pros* and *cons* of a commercial position with an *impartial* mind.

This discussion has been forced upon me most unwarrantably, I say, because my first letter was on a matter of fact—not opinion; and only under the most legitimate circumstances did I then for the first time make allusion to the subject of Mr. Kennett's so-called "unaccepted challenge." I am quite content to leave to the opinion of your readers who it may be who refuses the fairest challenge, and who makes it.

Apologising for trespassing on your space,—I am, yours, &c.,

Charles-street, St. James's, S.W., Herbert Kerr.
March 26, 1877.

[In connection with the above, Colonel Wortley writes as follows:—"The mention of my name as having been in the railway accident, in your issue of March 16th, has brought me a flood of correspondence, inquiring as to my health, from friends, from acquaintances, and from many known to me only by name. I am unable to answer all individually, and beg of you to allow me to say that I am making a good recovery, and hope soon to be at work again." Colonel Wortley thanks those friends who have offered to answer in this Journal Mr. Kennett's attack on him, which, however, he says he treats with contempt. Here the discussion may be allowed to terminate.—Eds.]

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ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

J. C. Stenning.—Thanks for more definite information.

G. S. Penny (Cheltenham).—Received. Thanks. In our next.

Meadow.—We sent your first letter to Edinburgh, and were made aware of the cause of the delay.

A Zummerzet Likeness Taker.—Thanks; but we are afraid that our readers will not understand your vernacular.

Rev. B. S.—You are quite right. We make a wide distinction between the *angular* aperture and the *actual* aperture of a lens.

Sylvia.—Do not attempt to reduce your over-printed proofs, as you will only spoil them. Give them a coating of a solution of wax in turpentine, and mount them as transparencies.

J. W. L.—We are unable to account for the markings in the collodion film, except on the supposition of the collodion being slightly over-iodised. Try the effect of adding a little more pyroxyline to the collodion.

F. B., Jun.—Our correspondent is desirous of obtaining cabinet or whole-plate portraits *in carbon* of the Prince and Princess of Wales. He has availed himself of every commercial resource, but without success, and now appeals to some fellow-reader for assistance.

Erratum.—In the report of the meeting of the Glasgow Photographic Association, in our last number, page 142, second column, an error occurs in the name of one gentleman on the committee appointed in connection with the inquiry on carbon patents. For "Mr. Smart" *read* "Mr. Stuart."

Doubleyew.—Do not tamper with or attempt to improve the negative, but take from it a transparency by any process which will give great intensity. Make use of the transparency so obtained in producing a second negative, which will possess as much intensity and printing density as you need desire.

H. G. Howadd.—While there is no objection to the use of a saturated solution of hyposulphite of soda for fixing negatives, there is a very decided objection to its being used of so great a strength for fixing albumenised prints. It lowers the vigour and weakens the half-tints too much. Try a strength of about four or five ounces to the pint.

Harry Manfield (Northampton).—The specimens received speak well for your care and skill in manipulating, and the subjects, too, are well selected. *Near Buckland, Surrey*, is a charming little picture, and the same may be said of *Near Lynemouth, North Devon*. The photograph of *Waves* requires a bit of sky to enhance its pictorial excellence, and those pictures in which there is sky would be much improved by the printing-in of clouds.

G. Edward Jenkins.—It is quite true, as you observe, that the light in the polarising lanterns made by manufacturers of the highest repute is polarised by reflection from a bundle of glass plates; but this method is inferior to that of making use of a large prism for this purpose. We have recently had a very large Nicol prism constructed with a view to supplant the polariser of our lantern hitherto in use, which consists of a bundle of twelve plates. So far as we have seen, after one or two trials, the gain will be *very* great.

H. H.—1. Either will answer.—2. We have not had experience of the keeping properties of the albumen and ammonia solution.—3. The plate may be immersed in the silver bath in the light, provided that the cover be put on the bath as soon as the plate has been immersed.—4. The light of a candle or steady lamp, protected by a yellow covering, will prove more suitable than daylight.—5. Oiled yellow silk or muslin.—6. The strong developer should be applied *ab initio*.—7. The Sciopticon Company, 157, Great Portland-street, W.

Edward Woodward (Macclesfield).—Our correspondent encloses an excellent sample of thin and very hard and smooth cardboard. He writes:—"In your article on the scenograph, in last Friday's Journal, you say you cannot obtain the smooth, hard cardboard. I have enclosed a piece for your inspection. It is called here 'press-board,' and is used by silk manufacturers to put between the silk handkerchiefs while they are pressed (sometimes hot-pressed and sometimes cold). The cardboard gives a gloss and finish to the silk after remaining in the press all night. This sample is rather thin. The man whose address I forward had no thicker in stock, but he is expecting some thicker every day. The price is one shilling per pound."

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Photographic Society of Great Britain.—The next meeting of this Society will take place on Tuesday evening next, the 3rd April (instead of the usual second Tuesday in the month), at 8 o'clock, at the Gallery, 5a, Pall Mall East, when the adjourned discussion on the *Silver Bath*, opened at the March meeting by Mr. John Spiller, F.C.S., will be resumed.

Trade Catalogue.—We have received from Mr. Richard W. Thomas, of Pall Mall, his descriptive catalogue of apparatus and specialities manufactured or sold by him. This catalogue is very comprehensive, embracing within its scope everything required by the photographer—a prominent position, it need scarcely be said, being occupied by those collodions in the manufacture of which Mr. Thomas has acquired so high a reputation. The patent box tent, another of Mr. Thomas's specialities, will also claim the attention of any reader turning over the leaves of this ample catalogue, which contains 76 pages, all crowded with the good things appertaining to our art-science.

Artistic Photography.—A few days ago we were favoured by a visit from M. Boissonnas, of Geneva, who showed us some specimens of photography, such as, we venture to say, have never before been seen in this country. By means of some modifications (to us at present unknown) in the chemicals employed, including the collodion, the bath, and the developer, M. Boissonnas has obtained a process so exquisitely sensitive as to enable him to take, in an ordinary studio, instantaneous groups of children with all the sharpness and depth of definition that can only be obtained by the employment of a diaphragm in the lens. For example: some groups taken *in the studio* on plates over twelve inches in dimensions are so sharp throughout that, in respect of definition, the extreme marginal figures are equally sharp as those in the centre, although in this group are to be found several dogs and babies as well as children and adults, the lighting being soft and harmonious. In the course of another week we hope to have some of these specimens on exhibition in our editorial office. The lenses by which they were taken were those of Mr. Dallmeyer in everyday use by photographers; but it is in the chemical modifications discovered by M. Boissonnas that such wonderful rapidity has been attained. It undoubtedly marks an epoch in the progress of our art-science.

The Silver Bath.—The editor of the *Journal* of the Photographic Society of Great Britain has appended the following "Note" to the report of the last meeting of this Society:—"It will be noticed that Mr. York calls attention to the fact that when the silver from an old bath is precipitated by the addition of metallic copper, the silver iodide is left unreduced. In making a new sensitising bath from an old one this is of no importance, as any excess of iodide can be filtered out; but it is well worthy of notice that the reduction of the salts of silver to the metallic state is not completely effected by copper. Neither the iodide, the bromide, nor the chloride of silver are decomposed by it. In fact, these haloid salts of copper are partially or entirely decomposed by soluble salts of silver, the haloids of the latter resulting from their contact with it. If it be desired to reduce the iodide to the metallic state, it is a better plan to throw granulated metallic zinc into the old bath, *slightly* acidulated with either sulphuric or hydrochloric acid. This will reduce *all* the silver salts to the metallic state. To get rid of any excess of zinc, acid must be added till all action ceases, and the precipitated silver must be well washed. If hydrochloric acid have been employed, it is advisable to rinse with ammonia before the final washing."

Photography in Court.—At the Bloomsbury County Court, on Monday last, the 26th inst., the case of Milne *v.* the London Steam Navigation Company was heard before the presiding judge and a jury. The plaintiff, an importer of photographs, sued the defendants to recover the sum of £27 for damage done in transit to a case of photographs which he had ordered from Berlin, and shipped from Antwerp in one of the defendants' vessels, consigned to the defendants, High-street, Camden Town. The plaintiff stated he was called upon by one of Messrs. Chaplain and Horne's carmen with the package in question and asked to signed the delivery note; but he declined to do so unless he examined the case, which contained goods of a perishable nature, comprising full-plate negatives and some valuable positives, which, for anything he knew, might have been injured in transit. When the case was opened three of the negatives were found to be broken, and almost all the positives were so injured either by salt water or steam as to be worthless for the purposes of trade. In answer to the learned judge the plaintiff said he had sued merely for the invoice price of the goods, and had made no charge whatever for his loss of trade. Two witnesses were called who proved that the contents of the case were injured to the extent mentioned in the plaintiff's statement. —It was urged by Mr. Willis, who appeared as solicitor for the defence, that the plaintiff had no case, as he had not proved where the damage sued for originated. He had Mr. Kupp's affidavit from Berlin that the photographs were carefully packed when sent by rail to Antwerp, and it was consequently not clear where the damage was done. It might be by rail, by steamer, or by Messrs. Chaplin and Horne. At this stage of the case the judge told the plaintiff he had been ill-advised to bring the present action without first obtaining professional advice. He (the judge) must, in the present aspect of the case, nonsuit the plaintiff under the old act, and give him leave to sue again if, after seeking competent professional opinion, he were so advised.—Nonsuit accordingly entered without costs.

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LONDON GAZETTE, *Friday, March* 23, 1877.

Partnership Dissolved.

The Woodbury Permanent Photographic Printing Company, Great Portland Street and Castlebar, Ealing; as far as regards W. B. Woodbury.

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 883. Vol. XXIV.—APRIL 6, 1877.

ON THE NEW METHOD OF ORGANIFYING DRY-PLATE FILMS.

We have been experimenting lately with the newest method of organifying dry films, consisting of the application of the organic solution to the plate after exposure and immediately previous to development, as recommended by Mr. Brooks. The end to be attained by the adoption of this course is said to be the production of dense images, upon films not otherwise capable of rendering such a result, by the use of an organifier, which, when applied in the ordinary manner previous to drying the plate, is conducive to a similar effect. It may be inferred that the same analogy exists with regard to the other properties of the preservative; in fact, the new method would appear to enable us to secure the beneficial effects of the preservative without its accompanying retarding action upon the sensitiveness.

A few weeks ago we had occasion to notice a somewhat similar expedient, the principle of which was also suggested by Mr. Brooks, namely, the addition of various matters to the developer in order to produce different effects upon the character of the deposit, and in the course of our remarks we stated, as the result of our experience, that the effect of any particular substance so added was similar in character to that produced by the same substance when used as a preservative in the ordinary way. It may appear to many, as it did at first sight to ourselves, that the conditions under which the organifier is used are similar in both the methods proposed by Mr. Brooks, and hence that the effect would be identical in each case; but practical experiment exhibits a very noticeable difference in the behaviour of plates subjected to the two forms of treatment. We have not far to seek for at least one cause of this difference. In the case of the addition of foreign matter to the developing solution we have the effect of a solution of given strength working simultaneously with the development upon the surface, and penetrating gradually into the film; while, when the organifier is applied to the plate before development, it is obvious that it is absorbed into the film, only a trace of the solution remaining upon the surface of the plate to mix with the developing solution when applied. Under these circumstances it is clear that the surface action is comparatively slight, while, as the developer penetrates into the film, it meets with fresh portions of the organifier, and the action, instead of growing weaker as the development progresses, is augmented in strength; and, as a further advantage, it may be mentioned that by varying the length of time the film is permitted to soak in the organifier a greater or less effect may be secured at pleasure. The following account of experiments is rather suggestive of the direction in which the principle may prove useful than descriptive of any real advantage actually derived therefrom.

Our first experiments were made with the object of verifying the account given of the behaviour of plates treated with an organifier previous to development, for which purpose we employed a washed emulsion giving a very thin image, and a preservative consisting of an infusion of coffee of ordinary strength with one grain of tannin to each ounce—a mixture not remarkable for any special density-conferring properties. The result showed very plainly a decided improvement, both in the colour of the deposit and the ease with which the strength of the image was obtained. Having satisfied ourselves on this point, we next proceed to compare the results of Mr. Brooks's two methods, together with plates prepared with the same preservative applied in the ordinary manner.

We employed the same washed emulsion in connection with the two new modes of organifying, while for the ordinary plates we prepared a fresh one using the same pyroxyline, and adhering as far as possible to the same formula, but omitting the washing and re-solution; plates coated with this emulsion were, after washing, treated with the preservative and dried. The preservative selected for these trials was similar to the one mentioned above, but containing a larger proportion of tannin, namely, five grains to the ounce, and gave with the unwashed emulsion plates any degree of density, almost to opacity. We may here, however, state that the results obtained with the latter plates were so far removed, and at the same time so different in character from the others, as to prove that something more than the mere question of the mode of applying the organifier was at work; that, in fact, the change brought about in the emulsion during the process of washing was so great as to render valueless any comparison between the results obtained with these plates and those given by the washed emulsion, hence we may leave the former out of our account.

It will be necessary to confine ourselves to a few general remarks upon the effects of the two remaining modes. Briefly, the *density* of the image was affected in the greatest degree, accompanied by the least retarding of the developing action, when the organifier was applied separately; but the greatest absolute density was obtained when the organifier was added to the developer. In this case, however, a longer exposure was necessary to produce an equal amount of detail, as the retarding action of the tannin appeared to overpower the developer. By varying in the one case the length of time the film was subjected to the action of the organifier, and in the other the quantity of the latter added to the developer, a considerable range of effects was obtainable, rendering it probable that great advantage may accrue from one or both of these modes of applying the organifier. A last experiment we made, and which appears to produce the most decided action of any, consists in adding the organifier to the alcohol used for moistening the plate. The substance we used in this connection was tannin alone—three grains to one ounce of equal parts of alcohol and water. We thus secured an extraordinary accession of density, or rather an increased facility for obtaining it without any apparent retarding action. We shall return to this subject at an early date, when our experiments permit us to enter more fully into details.

THE BEHAVIOUR OF ORGANIC ACIDS.

A letter from New York, published in a scientific contemporary, contains novel and interesting matter suggestive of a useful, practical, or theoretical bearing on photography. It calls attention to certain properties possessed by such so-called comparatively feeble acids as citric, tartaric, malic, and formic acids, which have hitherto remained unknown or unpublished. So far, however, from these acids having the feeble powers usually ascribed to them, the writer shows that even some most refractory minerals yield to their action. He has decomposed by the aid of citric acid mineral carbonates, sulphides, silicates, &c., in large numbers.

With the exception of cinnabar (vermilion) and a compound of molybdenum he has been able, with the aid of heat, to cause the speedy decomposition of all the sulphides he examined, and they were seventeen in number. Several of the silicates—the most difficultly-decomposable compounds—have yielded readily to the action of citric acid in solution. Taking advantage of the known action of tartaric acid in liberating nitric acid from nitrate of potassium, he has found himself able to dissolve metallic copper, lead, tin, and silver, and, by replacing the nitrate with chlorate of potassium, he has obtained the same results, but more slowly. Oxalic acid—usually considered such a powerful reagent—entirely fails to decompose the nitrate or chlorate; and in the majority of instances he found acetic acid to be the least powerful of any—less than formic, malic, &c.

It appears to us that from these data we may learn a lesson in everyday photography; and a few exact experiments in the direction, for example, of developing might lead to beneficial results. We are already familiar with the effect, for instance, of citric acid as a preservative for sensitised albumenised paper, a small quantity being sufficient to keep sensitised paper white for many months, and the peculiar red appearance it gives to the prints is well known. It was only recently we alluded to its action on the collodion film, the presence again there of a very little of this acid producing structural changes of a marked character.

With regard to the old acid developing we may call attention to the frequency with which either citric or acetic acid is directed to be used; indeed, citric, tartaric, and acetic are usually classed under the same heading as though their properties were similar. But let any one make a few careful comparative trials, and he will be surprised at the difference he will observe in the results he obtains. The same with pyro. intensifying solutions. An equal difference will be noticed between the action of the two most commonly-used acids. But it is rarely we hear of any trials with malic, oxalic, tartaric, or formic acids; yet some time ago great things were claimed for the latter.

To turn to the iron developer. The united opinion of the whole fraternity seems to have firmly settled upon acetic as being the best acid to moderate and modify its action. Yet we have used tartaric and citric acids in its place, and have been able to modify our results to a very considerable extent—far more than we can do with the strong mineral acids, nitric or sulphuric. To this latter part of the subject we may return at some future time; suffice it to say now that, by a judicious arrangment of the strengths of the solutions in conjunction with the acids employed, we are able to obtain a far wider range or latitude in the exposure than it is usually considered possible to attain with iron development. We have even noticed that citric acid has a special action upon old plates. Some experiments we made—now several years ago—showed that it acted very efficiently in removing the film and, at the same time, freeing the surface from that annoying deposit or stain which, though invisible, is so ruinous to clear shadows in negatives taken upon old once-used plates.

We think we have made a case sufficiently clear to induce photographers to give a little more attention to the peculiarities of organic acids; and we trust that the forthcoming season may bring forth fruit in the shape of useful additions to our practice of some of the less-known and used "feeble" acids.

BIBLIOGRAPHY.

Photography during its brief career has already had numerous applications—some exceedingly useful, but others less so. As a means of supplying *facsimile* copies of valuable documents it is unrivalled; and reprints, in *facsimile*, of original editions of the works of Shakespeare, Holbein, and other authors of past times, as well as copies of certain MSS. of Burns and other modern authors, are now easily accessible. The forthcoming advent of the four hundredth anniversary of the introduction of printing into this country has afforded certain writers an occasion for instituting comparisons between the wonderful extent of the circulation of the Bible compared with the sacred writings connected with other religious faiths. It has been stated that there exists a law of the Mahommedan religion prohibiting utilising printing types in the reproduction and multiplication of copies of the Koran. The precise nature of the existing objection to the use of types in connection with the reproduction of the Koran we cannot at present ascertain, although we have made inquiries from those who are believed to be in a position to know. Hence up to the present period all copies of the Koran made use of by the adherents of the Mussulman faith have been laboriously produced by writing with pen and ink. That this has arisen from a desire to keep their "book of the law" free from error is without doubt, although, reasoning from strict analogy, this seems to be the very best means of introducing error.

It is pleasing to find that the high religious authorities of the Mohammedan faith have at length decided that although the typographic art, pure and simple, may not be applied to the reproduction of the Koran, the art of photography may be invoked to provide the means of disseminating their sacred writings. It is believed that if a copy of the Koran recognised as perfectly accurate be placed in the light, and another copy of its pages be obtained by photomechanical means, there will obviously be no chance of errors occurring in such reproduction. By means of photolithography and phototypography—the latter of which is suitable for working at a modern printing-machine—it is not too much to say that in a brief period copies of the Koran in the original Turkish language may be as easily procurable in the towns and villages of oriental countries as they now are in London, where the English translation may be obtained at any bookstall at a shilling per copy.

Of still greater interest would it be if the Russian government allowed a photographic reproduction to be made of what is recognised as the oldest copy extant of the New Testament, to be found in the Imperial Library, at St. Petersburgh, where it is only to be consulted under the strict surveillance of an armed guard. If this valuable work were reproduced with the degree of accuracy appertaining to photography alone, how many disputed minor points of doctrine might not cease to exist! It is well known among bibliographers who are students of the New Testament in the original Greek that by the introduction in the copies of apparently trifling marks of no larger dimensions than a comma the whole sense of a passage may be inverted or, at least, seriously modified, and it has frequently been insisted that such "marks" have been intentionally made or varied with the view of supporting special dogmas. By the production of one good photographic copy all such differences would cease to exist.

As public attention will inevitably, by the new and liberal policy of the Mohammedan religious functionaries, be directed to the reproduction of other works by similar agencies, we anticipate a rapid demand for *facsimile* reprints of rare works. For the most part such reprints have hitherto been made by the aid of photolithography; and, with such a work as Holbein's *Dance of Death* on our shelves before us, it would be unjust to say that this process is not equal to the task of *facsimile* reproduction. Still it is in phototypography that the art of reproducing scarce works will find its chief outcome, speed and quality being alike the concomitants of this method of printing.

Those who desire to practise either branch will find ample directions given in our Almanac for last year—than which nothing more recent has appeared.

The meeting of the Photographic Society of Great Britain, on Tuesday evening last, was in several respects one of great interest. In the first place, the lucid demonstration given to the members, by Captain Abney and Mr. Warnerke, of the value of bromide of copper, followed by nitrate of silver, as a means for intensifying a collodion negative, must prove exceedingly interesting on account of the chemical reactions involved in the process, and also eminently useful to those who have to produce negatives of great intensity, as, for example, in the processes of photolithography, phototypy, and, in short, in all processes involving the copying of engravings or printed matter. The exhaustive experiments of Mr. Warnerke, recorded in our report of the meeting of the Society in another page, attest the care and diligence of this able experimentalist. But not less interesting was the splendid collection of pictures of a more or less instantaneous character exhibited by Mr. J. H. Dallmeyer, who further gratified the members by enabling them to examine carefully a large collection of the far-famed pictures of Mr. Kareline, of Nigny-Novgorod, Russia—a favour of which the members eagerly availed themselves. We presume that any of the members who were unable to attend the meeting on Tuesday, and who choose to call upon Mr. Dallmeyer, will still have an opportunity of examining these art-treasures; and we anticipate that many will gladly embrace such opportunity, if we may judge by the interest taken in Mr. Kareline's artistic work by those who have examined a specimen we have in our office, where it will remain for a few days longer. Of the various pictures exhibited, it is probable that none surpass in attractiveness two marine views taken by Messrs. Perkin and Son by means of a rapid rectilinear lens which, as indicated by the general sharpness and depth of definition, must have been employed with a stop, yet in which is shown every ship and other smaller craft delineated with such perfect detail as can only be secured by instantaniety of exposure. On the subject matter of the discussion we shall reserve our own observations until its termination. The interest in the points discussed continues unabated, and it is not by any means improbable that it may afford a theme for pleasant discussion for two subsequent meetings.

THE importance to the landscape photographer of a form of camera-stand which combines in itself the desirable qualities of portability and steadiness when in use cannot be over-estimated; and, though there are many different patterns in the market which answer these requirements, there is still room for improvement in the matter of simplicity. For pure landscape work there can be no doubt that the simpler the arrangement, and the less liable it is to injury from occasional rough treatment, the more really useful will the stand be found; and we think that many of the forms at present in vogue err slightly in the direction of unnecessary complications. Of course for architectural purposes the conditions are considerably altered, and many little refinements which are almost useless in pure landscape become necessities. These requirements are fully met in several of the better-known descriptions of tripod, and those of our readers who prefer to travel completely armed for all purposes will have no difficulty in suiting themselves. But there are others who sigh for a greater freedom from the "refinements" and the additional bulkiness which necessarily accompanies them; and for the benefit of such we have pleasure in describing an exceedingly simple as well as firm and portable stand we have recently seen, which has been devised and constructed by one of our amateur acquaintances. The chief and, perhaps, only complaint which can be brought against the simple forms of folding tripod now in the market is their apparently needless bulk, which arises from the fact that each leg when folded consists of three, or in one form four, separate pieces hinged together; in the form we are about to describe the number is reduced to two, and each leg when extended for use is composed of a single piece, instead of being divided as the ordinary tripod head requires. Each leg consists of two cylindrical pieces of wood of suitable length fastened together—not with a hinge, as is usually the case, but with a sort of link arrangement formed by driving a small staple into the end of each piece, and connecting them by means of an independent link of sheet brass so as to permit them to fold together side by side, without interfering with the sliding tube to be next described. About three inches from the joint end of one piece the wood is turned a little thinner, so as to allow a piece of stout brass tube to slide easily on and off, and about an inch of the other piece, but the last must be made to fit pretty tightly into the tube. When the leg is folded the tube rests entirely upon the one half; but when it is straightened, and the tube passed over the hinge partly on to the other half, a perfectly rigid leg is formed, one end of which is fitted with an iron spike the other with a ferrule of the same sized tube as that used in the centre, the tube projecting about an inch clear of the wood. The tripod head consists of a circular piece of hard wood, to which are fixed, with ordinary brass hinges at the apices of an equilateral triangle, three pieces of wood which are turned to fit firmly into the ferrules on the legs. The whole arrangement is so simple as to require no descriptive diagram. The advantages are—the absence of loose pieces, the ease with which the stand is packed and unpacked, and a clear gain of at least one-third in the matter of bulk and weight (owing to dispensing with the double leg), while, when erected, the tripod is at least as firm as the double-leg forms made from the same thickness of material.

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NOTES ON CHROMOTYPE PRINTING.

I SEND you a few remarks on carbon printing, and my method of producing perfect chromotypes with great speed and absolute certainty. I do this partly as a matter of public interest, and partly as a reply to numerous correspondents whose inquiries I find too great a tax on my time to answer personally.

I think I may call myself a successful carbon worker, for in my hands the process never fails. It is not merely a question of what can be done with Autotype materials, but of what cannot be done—so much power and scope does the process put into practical hands; for I am sure that we not only get permanency to replace fading, but that far more beautiful and effective results are obtainable in carbon than in silver, and that we are only beginning to see the great value of the new method.

My previous letters seem to have attracted a good deal of notice, and now that Sir Thomas Parkyns has in your pages called further attention to the speed and certainty of my working, I am likely to be overwhelmed with letters. Will you please let me say to correspondents that I cannot find time to give the details of my method in writing; but if any photographer is desirous of becoming a chromotype licensee, and wishes for an independent demonstration, let him come down to Salisbury, bring his own negatives, and he will find me ready and willing to show him how easy it is to produce excellent permanent prints.

Now let me repeat what I have stated before—that nearly all the failures I see are due to using the water too hot at the commencement of development. This is most important. Begin at seventy per cent., not more, and do not let your plates soak in a grooved tank. Next wash up your prints in water contained in flat dishes of zinc or tin. Some will say that unless the water be tolerably hot at starting the paper backing of the tissue will not come away. Here is the remedy:—Take your prints from the frames, apply them to the collodionised glass in the usual manner, and then put them under pressure for the space of two minutes only. You will find then no difficulty in stripping the paper backing nor in development, but if you keep the prints under pressure for ten or fifteen minutes you will be simply raising a crop of little difficulties. Try the experiment, I say, and you will be soon convinced that this point is important.

Reticulation.—I very rarely see it, and cannot yet explain the cause when I do. For want of a better reason, I incline to think it must be due to some fault in the material or in the manufacture of the tissue. Certain I am that reticulation does not depend on the quick drying of sensitised tissue. I have tried this repeatedly. The causes must be sought elsewhere. In proof of this I send you herewith two *cartes* treated for experiment in the following manner:—I took a piece of tissue, immersed in the chromate bath till sensitised, then removed it, face downwards, to a clean sheet of glass, drove out superfluous water with the squeegee, and then pressed it under blotting-paper to absorb all moisture possible. This done I held it, back and front, before the fire to dry, and in from twelve to fifteen minutes had it under a negative in the printing-frame. After exposure soak and apply it to glass, and put it under the two minutes' pressure only prior to development; as soon as developed fix, and as soon as fixed apply the transfer paper. Again put it under pressure for ten minutes, and you will find the image perfectly picked up—nothing lost, but much better, in fact, than if the pellicle is allowed to dry before transfer. Then, if in a hurry, strip and dry before the fire, and you can astonish your client with a perfect carbon print, mounted and complete, in a very brief space of time—about two hours. These I may call the "Salisbury express *cartes*;" but, of course, I describe this experiment only to show what speed is possible, and that reticulation is not a consequence of rapid drying of sensitised tissue.

I do not recommend hurry of any sort in photographic printing; but I wish your readers to note that I claim great advantages by transferring as you go along. Do not fix, dry, and transfer, but avoid the drying. You have more perfect results that way, and, into the bargain, it has practical conveniences. You can strip all the plates during the morning and have them all ready for the first batch of prints of that day. I find the practice so easy, being only a little more costly than silver, that I am now giving up the latter entirely for portraits, and I find the change quite easy, because my own wishes are seconded by the public taste. I have only to place before my customers specimens of chromotypes and silver prints from the same negatives—to say the former will not fade, while the latter cannot be guaranteed—and forty-nine out of fifty of my clients elect to take the chromotypes at the higher price. And assuredly, in addition to the permanence, the chromotypes are more brilliant and more uniform in colour and in tone than is possible with silver.

With regard to "full gloss," I have an idea that this would be facilitated by having a much thicker transfer-paper—say three or four times thicker than the ordinary double transfer. With summer weather coming there would be no difficulty in drying. If not found thick enough for use, a thin card could be added, with glue or india-rubber solution, which would not penetrate the thickness of the paper, and consequently the full gloss would be preserved to the satisfaction of the customers who desire it. I do not like it myself, but I do not expect my customers to adopt my standard and taste. "Variety is pleasing" is an old text copy, I remember. I think the Autotype Company will do well to consider my suggestion of a thick double transfer-paper for the special purpose indicated.

I have some novel ideas on trial in regard to further advances in chromotype printing, which, when my experiments are completed, I will certainly give to chromotype licensees through the medium provided by the Autotype Company. Carbon printing is no longer an experimental toy but a commercial question, and I think outsiders will be unreasonable to expect gratis what others obtain by purchase and experiment. C. J. Witcomb.

NOTES ON PASSING EVENTS.

By a Peripatetic Photographer.

The adherents of the carbon process appear to be in a state of effervescence at the present time. The retirement of a veteran tissue-maker, Mr. J. A. Spencer, from the Autotype Company seems to have been the signal for extreme turbulence in the tissue-making world; and Glasgow, among other districts, is in a condition of feverish excitement. I am surprised at the recent display of emotion in the Scottish commercial capital, because, if the photographers there had possessed one-half of the far-seeing proclivities with which they are credited, they would have known from a two minutes' perusal of Mr. Swan's patent that this gentleman never laid claim to the preparation of carbon tissue as an item in his patent; then why should they worry themselves in organising an opposition to a thing that is non-existent? But, to descend from polemics to technics, it is pleasing to be apprised, as I have been, that carbon tissue is now being issued in a sensitised form; for I have in my possession a print about which there is nothing amiss, and which was made four weeks after the sensitised tissue came into the hands of the printer. Wherein lies the secret of its preparation? I presume a weak sensitising bath and an excess of alkali may point to the secret.

One's breath is apt to be taken away by the announcement that large groups on large plates can be taken in a studio by means of a lens well stopped down, and with an exposure so very brief as to permit of babies and dogs being taken before they have had time to move. And yet one ought not to be surprised at this. An advance has been made in every other department of photography, and why not also in rapidity? It is not very greatly to the credit of the spirit of progress that in a studio at the present time the same length of exposure is given to a negative which was given nearly a quarter of a century ago. The subject of offering medals for "pretty" pictures is one that occupies a place annually in the transactions of some photographic societies. If the Photographic Society of Great Britain would confer a lasting favour on the public let it offer a gold medal for a process, wet or dry, which shall give a plate possessing a greater degree of sensitiveness than any hitherto publicly known. *This* would do more good than giving an award to an individual so happily placed as to be able to supplement his taste by working with larger apparatus or employing more costly labour than his fellows. But where is the stimulus to original research when societies, such as the extinct Photographic Society of Scotland, entertain such views as to offer bronze medals for valuable inventions and silver medals for the products of such inventions? Is it to be wondered at that, under such a *régime*, secret processes still exist?

As I was the chief cause of the publication by Mr. Herbert B. Berkeley of the washed emulsion process to which he had previously alluded, it is right that I should be prominent in thanking that gentleman for having complied with the wish so expressed. In photography, as in horticulture, the seeds sown in March will doubtless spring up and blossom before many months elapse. Speaking for myself, the process so generously described by Mr. Berkeley would have been tried before now but for the existence of circumstances which proved inimical to active experimental work.

In connection with the subject of portable camera-stands, on which I treated in my last month's *Notes*, I have been reminded by Mr. Baynham Jones that he has, in your last Almanac, given a design whereby an excellent portable stand may be constructed. I ask his pardon for having, at the moment of writing, overlooked his useful article. The fact is there is so much matter of a most varied and practical character in The British Journal Photographic Almanac for the current year that I may well be excused for not having it all at my fingers' ends. I even question if the editor himself can have yet mastered *all* the details of the work; if he have, then do I envy him his powers of mental classification and retention.

Blue china has of late been pressing very heavily on the brain of the *virtuosi*; blue glass seems in a fair way of exerting an equal amount of pressure upon the brain of some advanced classes in America. It is not enough to know that a suitably-placed ægis of blue glass helps to ripen seeds, hastens vegetation, and exercises altogether an influence of a most wonderful description upon what is termed vegetable life; but it now transpires that this ray also has much to do with the conditions of human, or at least animal, life. Since the discovery that all kinds of disease at all "succumbable" will succumb to blue glass, the transatlantic glass-makers have had their hands full of work. Rheumatism, cramp, hysteria, hypochrondriasis, headaches, and a score of other complaints, have all been successfully treated by incarcerating the unfortunate subject of each or all of them in a kind of studio, or rather cage, to which no light finds access save that which has been filtered through blue glass. Every remedy, like every proverbial dog, will have its day; and there is no use in trying to stem a torrent like this, which will soon exhaust itself. One kind of light suggests another, and it is fortunate that the violet-light-for-the-studio mania which recently prevailed on the continent has not visited, nor is it likely to visit, this country. And this, in turn, prompts me to make the remark that a somewhat undignified place has been accorded by the *Scientific American* to the aëro-hydrostatic machine recently described in glowing language by Professor Stebbing in this and an American journal. The *Scientific American* actually goes the length of classifying it with the "Keely Motor Deception"—an alleged invention by means of which a pint of water was to have propelled a railway train for ever so many miles; only it didn't, nor was the attempt ever made, so far as I have heard.

LANDSCAPE PHOTOGRAPHY.

[A communication to the Glasgow Photographic Association.]

I feel that it is somewhat presumptuous in me even to seem to give suggestions in photography to gentlemen who are so greatly in advance of me both in its theory and practice; and you will, I trust, believe me when I say that I do so tonight rather in the hope of benefit to myself and to the Association by the after-discussion to which the following remarks may give rise, than with any idea that what I may say can be new to any of the gentlemen present.

I am, indeed, an old amateur, having taken great interest in photography since the early days of collodion; and I have thus watched with interest most of the changes in materials and processes since that time that have successively engaged the attention of experimentalists in the science. But though my acquaintance with and interest in photography have thus extended over a number of years, my experience in the way of practical working has been very little—less, indeed, in all that time, probably, than is crowded into a short month or two of the practice of many of the gentlemen present; for I can only give to it a small part of the very brief holiday time available to a man closely employed in business and having many other calls on his time.

My earliest attempts at landscape photography (and it is only to that I have given any attention) were with a Newton's camera 8 × 10 and a long-focus Ross' lens of three inches diameter. The sensitising, developing, and clearing baths were all, as in Newton's, suspended below the camera, the whole thing being an immensely unwieldy affair, to carry which I had to utilise the tripod legs, on which it was suspended by straps, and carried by the aid of a friend, exactly in the fashion of a mason's hand-barrow or a miniature sedan chair of bygone days. The method of working such a camera—apart from its cumbrousness—proved unsatisfactory in the extreme, though I see it has recently been revived under a French patent, I think. I next got a folding camera—*portable* by contrast with its predecessor, but still a bulky and troublesome affair, and, together with a tent, chemicals, &c., making such an amount of *impedimenta* as to rob an excursion of all its pleasure, not only as regards myself, but also as respects such friends as were generous enough to allow themselves to be pressed into the service as assistants.

Several varieties of tent and sizes of camera were contrived, each improving some defect in its predecessor, and I succeeded in getting some fair work; but the cost and labour far exceeded the results, and were it not for an ardent love for the work, and an insatiable craving after the beauties of nature, I would have given it up in despair. The hope of ultimate success, however, carried me on; and the pleasure I really felt in the work, and the satisfaction of conquering difficulties, were my reward—and my *only* reward—for photography has never yielded me a shilling in return for all I have expended on it, so that I may fairly claim to be truly an amateur.

Dr. Taupenôt's collodio-albumen formula for dry plates gave me the first relief. I tried it, succeeded—to my own satisfaction at any rate—and discarded my tint and wet plates for years. Taupenôt's process had one fault, however, in its great liability to blisters; and these sometimes sadly annoyed me, though I took every precaution, gave a preliminary coating of dilute albumen to the plate, and adopted every likely suggestion as a remedy for the evil. Fortunately, however, the blisters generally dried flat, so as not materially, if at all, to affect the printing qualities of the negative. But it was sometimes otherwise, and a negative which at first promised to be perfect would, when finished, prove useless.

Two or three years ago I was induced to try a modified collodio-albumen process known as "Dr. Ryley's hot-water process," and on plates so prepared I have not known the annoyance of a single blister, though since I first tried it I have prepared many plates. Indeed, except a few experimental beer-and-albumen plates, I have confined myself entirely, for dry plates, to the "hot-water process" ever since; for my opportunities for photographic work are too rare to permit of wasting them in experiments in untried processes, however much recommended, and I attribute any success I have had to this *sticking to one process*. Where the object is to take good negatives I would strongly recommend amateurs to do the same, unless they have plenty of leisure, and in that case there is, no doubt, great pleasure and benefit in experimenting.

But first loves are strong, and so I returned from time to time to my wet plates. A few years ago I contrived a very portable and convenient box tent, which gives but little reason for complaint on the score of weight or bulk. It is suitable for plates up to 7 × 9 inches, and, when folded up for carriage, contains a water-tight bath, ebonite developing tray with plate glass bottom, and a stock of chemicals sufficient for a long day's work; yet it may be carried in one hand for a long distance, and only measures, when closed, 15½ × 12½ × 6½ inches, while two or three minutes are sufficient to erect it and put it in working order on its own tripod. I have taken many of my best wet-plate negatives with this tent. I have brought it tonight thinking it might furnish a hint to some member on which he might probably improve. I confess that I prefer wet plates to dry wherever I have convenience for working them; and, wherever the view I wish to photograph is reasonably near to my head-quarters for the time being, I employ wet plates. I have, however, always the dry to fall back upon when the distance is considerable or the time for preparation limited, or where the employment of the wet process would interfere with the pleasure or liberty of any friend with whom I may be out for the day. These are the occasions on which the advantages of the dry plates show themselves, and many good pictures may be obtained by means of them when the wet process would be quite inadmissible.

As to the camera: I would only say that no one should think of working without the advantages of either a swing back or a swing front, and the motion of the back or front, or of the two combined, should be such as to give the means of adjusting the focus not only for different distances in *front*—such as a very near bit of foreground, or a tall spire, &c.—but for different distances to the one side or the other, as the side of a street or avenue, &c. Many good subjects will, indeed, present themselves, for taking which satisfactorily these are not in the least necessary; but, on the other hand, without such appliances many inviting subjects either cannot be taken at all or taken at a great disadvantage, rendering it necessary to have some portion of the subject, on which much of its interest and beauty depends, either left out altogether or quite destroyed for want of true focus; as, for example, the old wall in the foreground of *Old Dailly Church*, which was within a few feet of the camera, and could not have been included in the view but for the aid of my swing front, and the *Avenue View at Polmadie*, which required the use of the lateral motion of the back to bring the near side into focus. I also always carry a small spirit level; indeed, I have one fixed on the camera by a screw at one end, on which it pivots. This is most useful, not only in taking buildings, but in working on a hill side where the eye is often quite at fault as to horizontal lines.

Thus much for the negative (leaving details to the end); and in anything I have to say as to printing from it I shall limit myself entirely to a few remarks on skies and cloud effects.

I am often surprised to see landscape photographs beautiful, indeed, so far as the landscape proper is concerned, but with nothing above it except a mass of white paper, and these sold as the productions of professional photographers. Such work does no credit either to the taste of the photographer who produces them or of the public who purchase them. The sky is half the picture—sometimes, indeed, the "better half;" for the charm of the original of which the photograph is the transcript is often mainly in the sky and in the aërial perspective which it gives. Take a moorland view, for instance, with a pool of mossy water and a few rocks and ferns and stunted furze for a foreground, and a bright sky with fleecy clouds overhead, stretching away till it meets the distant hills that bound the view. What a charm there often is in such a scene! and how beautiful the miniature representation of it as we see it on the screen of the camera! But print from a negative taken from such a scene, and how disappointing is the result! Wanting the cloud effects it is a mere caricature of the landscape it professes to portray; whereas if a suitable sky be skilfully printed in the beauty of the original is restored, and the pleasurable emotions which it produced are re-awakened as we look on the faithful reproduction. Such a scene as I have here supposed is, indeed, more dependent on the sky for its effect than one presenting greater variety of form and subject and boldness of outline. But every landscape that includes a sky-line is dependent more or less on cloud effects for its beauty; and if the sky be left in the print a dead blank—as it too often is, both in professional and amateur work—the picture is robbed of its charm, and photography is unjustly held responsible for a defect which ought to be charged to the want of taste in the photographer. What would be thought of the painter who sent a picture from his easel in this state? It certainly would be refused admission to any exhibition in the kingdom; and why should the photographer be judged by a different standard, especially where the defect can be easily remedied? It shows no honest desire to raise our art or educate the public taste. Perhaps, however, with the professional the price which the photograph will bring in the market has something to do with the matter; for, as a rule, the cloud effects must be produced by a separate printing from the foreground, so that it necessitates an expenditure of more time and care, and, therefore, of more money, which, from a mere commercial point of view, may not be thought desirable. Yet it is much to be regretted that anything should induce an artist to set before him any but the highest standard of excellence to strive after; and I believe it is a false policy in the end, for the best work will command the best price, and give the satisfaction of an honest endeavour after the highest attainable results.

We have not yet, as I have said, reached that stage in photographic progress where clouds and landscape can be satisfactorily rendered in the same negative—at least this can only be done under very exceptional circumstances; and the fact is that we must either sacrifice the sky to the foreground or the foreground to the sky. Sky-shades and similar adaptations are very useful in their way, especially in preventing the obliteration of a delicate distance; but it remains true that only in the hands of the most skilful operators—and even with them rather as an occasional triumph of skill than as their regular work—do you get a negative satisfactory both as to the landscape and the sky.

Perhaps the interesting suggestion thrown out, in a recent number of The British Journal of Photography, to use a Nicol's prism attached to the lens may point the way to some practicable and practical solution of the present difficulty; but, until then, we must be content to produce the cloud effects in prints by a second printing from a cloud negative.

Of course it is best to take such cloud negatives from nature, and with a few such negatives, giving different characters of sky and different directions of lighting, great variety may be produced. But with myself, my opportunities of a day in the country with the camera—that is, a *suitable* day—are so rare that I am always inclined to turn my attention to the landscape, and trust to some other means of producing the sky effects. As possibly this may also be the case with some other amateurs, I take this opportunity for describing the method I now generally adopt, and if they follow any different method I would be glad to be favoured with a description of it in turn, and so we may be mutually helpful to each other.

I have from time to time tried various methods, but the chief of these have been either to paint in cloud effects on the negative itself, doing so on the *back* so that the lines may be softened by diffusion in printing through the glass, and in this way only one printing for foreground and sky is necessary; or, to paint on thin tracing-paper, with china ink, a series of cloud negatives, one or other of which may be used according to the subject of the landscape for a second printing. The first method is only available in negatives where the sky is very thin, and the results, at least in my hands, are not very satisfactory; I therefore almost always employ the second method, which I find gives very good results if carefully used. I have brought a few such sky negatives, and prints taken from them, to show the results. They present this, among other advantages—that by merely turning the one side of the paper or the other you may change the direction in which the clouds are lighted, so as to suit the light in the landscape. And I would here suggest that the same advantage might be obtained with cloud negatives taken in the camera by removing them from the glass and transferring them to a transparent gelatine or tracing-paper support. I do not use a printing-frame with these paper negatives. Taking the print from the frame with the landscape only printed, I pin it on a board, and cover the foreground with a stout pasteboard, or any such thing, having first laid down the cloud negative in the most suitable way for the particular subject; this, of course, all in yellow light. Then with cotton wool I shade off the sky line of the landscape, the wool being under the edge of the pasteboard, so that the latter keeps it in position, while the wool prevents the sharp line which the pasteboard would make in the print.

If the sky be broken up by trees or otherwise, so as to be seen in patches only, I cut holes in the protecting pasteboard somewhat larger than the patches of sky to be produced, and fringe these holes round with the wool (the cloud negative, of course, being always under the wool and pasteboard, and next to the print); then laying a weight on the pasteboard to keep all in position, I expose it. In practice, I have a number of pasteboards with different-sized holes always ready at hand, and it is easy to alter the size of these to suit any particular case on a moment's notice, by selecting one larger than is wanted, and filling up the excess of space with a fragment of brown paper, or an extra supply of cotton wool.

It only remains now that I very briefly give the formulæ I employ, in which, however, there is absolutely nothing new, my authorities for all of them being either The British Journal of Photography or its Almanac, or the *Year Book*. First, then: for wet plates in the field I use old collodion sensitised at least six months—longer if possible—and a distinctly acid bath. For developer I use Mr. B. J. Edwards's formula, namely—

Sulphate of iron	1	pound.
,, ,, and ammonia	1	,,
,, copper	1	ounce.
Water	87½	ounces.

This gives 160 grains to the ounce of water.

I carry one ounce of this in a dropping-bottle, and another bottle with acid water, in the proportion of one of glacial acetic acid to thirteen of water, with spirit of wine as may be required. Both of these I keep ready in stock in my laboratory, and fill the tent bottles just as required. For a 7 × 9 inches plate I pour into a wide-mouthed bottle, which I use as a developing cup, three-quarters of an ounce of the acid water; and as every drachm of the iron solution contains twenty grains I can at once suit the strength to the subject, the light, and the exposure. I always give a long exposure to take up all that is in the shadows; and, if there be a great range of distances, I add just about twelve to fifteen drops of the iron to the three-quarters of an ounce of acid. This gives a strength of a little over five grains per ounce, under the action of which the delicate distances come out, and then I strengthen with other fifteen up to thirty drops, as may be required, to bring up the foreground. I generally finish on the spot, and to save copious washings in the tent I strengthen, if need be, with iron, citric acid, and silver, as it is then unnecessary to wash from the first developer. When density is obtained I pour on a few ounces of water, previously placed in a six-ounce bottle in the tent; then, opening the door of the tent box, I take out the tray with the negative, wash thoroughly and in freedom in the open air, and clear with the cyanide, which I always keep in a bottle *in my pocket*, marked legibly "*poison.*"

The formula for the hot-water process is exactly as in The British Journal of Photography, vol. xx., page 203 (which I refer to), including the final wash of gallic acid, unless the plates are to be exposed within a few days after the preparation. With the gallic acid they will keep for months; but I always try to have them developed as soon as possible after exposure—say within a week or so, or sooner if no gallic acid be used. After rinsing with water, *before* applying the gallic acid, I flood with a little distilled water. I should have mentioned, also, that after removal from the silver bath I soak in two trays of distilled water, and then rinse well under the tap, finishing with distilled water before pouring on the albumen. The first washing, at anyrate with distilled water, I think very important, as, unless the water be pure with which the free nitrate of silver is removed, insoluble salts of silver may be formed on the surface of the plate, which may seriously modify the after-results. The extent of this evil will, of course, depend on the nature of the water used for washing; but, unless the composition of the water be known, it is safest to take the precaution of beginning and ending with distilled water.

The formulæ for the collodio-albumen or Taupenôt plates are numerous, and I have used sometimes one, sometimes another, without noticing much difference. That of Mr. Price, as given in The British Journal Photographic Almanac for 1871, is very good, only I prefer to pour on the albumen instead of using it in a bath, as I think the bath method is more liable to cause air-bells in the albumen, of which it is very difficult to get rid. His formula for the albumen is as follows:—

Albumen	8 ounces.
Water	1 ounce.
Glacial acetic acid	24 drops.

Stir well up for two or three minutes with a glass rod, and, after rest for an hour, strain through muslin; then add half-a-drachm of the strongest liquor ammonia, and iodise with forty-two grains of iodide of ammonium and six grains of bromide of ammonium. With a small bit of camphor in it, or a few drops of carbolic or salycilic acid, it will keep good for years—certainly for a whole season.

The collodion, both for this and the hot-water process, should be open and powdery, so as to give a surface, when sensitised, that will receive and retain as much of the albumen as possible. *Steps of process:*—1. Dilute albumen substratum. 2. Collodionise. 3. Sensitise. 4. Wash well. 5. Bath of common salt. 6. Wash well again. 7. Flood with albumen and pour off first dose in the sink; flood with second dose, and let it flow back and forward so as to sink well into the film. 8. Drain till surface dry, then dry in hot water bath at boiling point. All this may be done in daylight, and the plates in this stage will keep for years, so that a large stock may be prepared. When wanted for use, lay, face down, on a fifty-grain aceto-nitrate bath for about half to three-quarters of a minute—not longer; wash thoroughly—first in a bath of distilled water, then under a tap, finishing with distilled water. Finally flow over a two- or three-grain solution of gallic acid, and dry without heat. No backing is required, and they will keep a long time in good condition.

Alkaline development is suitable, though they may also be developed with plain pyro., and finished with acid silver.

John Parker.

NOTES FROM THE NORTH.

In continuation of the description of a visit to the works of Messrs. George W. Wilson and Co., at St. Swithin's, Aberdeen, our attention must next be turned to the printing, toning, and washing departments.

These operations are carried on in a building measuring, roughly calculated, some 100 by 30 feet. It is two stories in height, or rather one story and an attic, and is oriented east and west, with a northern exposure for printing. On the north side the roof descends, pent-house fashion, at a gentle angle to within about four feet of the floor, the lower nine feet being glass, and forming a kind of shed, jutting out from the main building, of eighteen feet in width. Under this shed or, more properly, printing gallery are arranged, side by side, twenty strong tables mounted on wheels which run in grooves formed in a concrete or cement floor, and work so smoothly that even when loaded with forty frames a very slight push is sufficient to move them from one place to another. In this way eight hundred frames are easily attended to by three assistants, and with twice that number of "fillers" and "carriers" a tolerably large day's work may be accomplished. For so considerable an amount of work the movable tables are exceedingly convenient. In suitable weather they are pushed out into the open air; but on the appearance of a coming shower the whole can in less than a minute be safely placed under glass, and in the same space of time may be brought under the opaque part of the roof, where the prints can be examined away from the glare of the light.

Of the many devices for vignetting probably that most generally adopted is the use of cardboard, with suitable openings, placed outside the frames. In consequence of the lightness of the material, especially if the printing be carried on in the open air, some method of fastening the board to the frame is necessary, and in whatever way it is done it consumes a good deal of time, which is money—and a good deal of money, too, in such large establishments. The method adopted at St. Swithin's seems to answer admirably, and, although more costly at first, is undoubtedly true economy in the end. Here the vignetting *boards* are sheets of lead, in which suitable openings are cut, and the edges beaten up to any desired extent. In this way any degree of softness is readily secured, and without any fastening other than their own weight they retain their position even in a pretty stiff breeze.

The principal part of the main building is occupied by a room seventy by about twenty feet, having along one side a double row of presses, the shelves of which are grooved like ordinary plate-boxes, and in which are stored over 45,000 negatives, representing very nearly five tons of glass. On the other side of the room is a long table, above which are a series of windows admitting only yellow light, and on this the filling and emptying of the frames are carried on. Expedition being the order of the day, every little "dodge" by which time may be economised is of value. Where such a large quantity of work has to be done the frames must, to economise space, be as nearly the size of the negatives as practicable; and that they may lie close together they must be free from projecting parts. Those in use at St. Swithin's are of the well-known box form with angle grooves, along which crossbars can be pressed firmly upon the back-board. Under ordinary circumstances, when the negative is nearly the full size of the frame, there is some waste of time in filling and emptying. In the frames in question the glass fitted somewhat loosely, and, in emptying, the bars were rapidly removed, and the whole, glass included, at once turned out on the hand. In filling, the back-board was first laid on the table and covered with a sheet of blotting-paper the same size. On this was laid the sensitised paper, on it the negative, and then the glass. The hand was slipped under the board and the frame rapidly placed over the whole. In this way the operator can more readily see that everything is in proper relation to everything else, and do the work in less than half the time occupied by the usual mode. I do not know if this is really a new thing; it was so me, and hence it is given for what it is worth.

A door at the west end of the filling-room leads into an apartment thirty-six by twenty-eight feet, devoted to toning and washing operations. Those of my readers who remember an article written by Mr. Wilson some years ago, in which he boldly more than hinted that we should not want photographs to be permanent, will, perhaps, not care to know how the washing of prints is managed at St. Swithin's; but if they will look over such albums as may be close at hand containing specimens of Mr. Wilson's work, their freshness and freedom from fading will show that either he was enjoying a quiet joke or that he does not carry his principles into practice. "Are we going to be let into the secret of how the beautiful tones which have been so long admired are produced?" I think I hear some of my readers asking. In reply I am unfortunately under the necessity of saying "no"—simply because there are no secrets in connection with the establishment, unless it be that of how best to bring common sense to bear on the work in hand.

The members of the firm seem to possess the knack of finding out the particular duty which each of their half hundred *employés* is best able to discharge, and leave them very much to the devices and desires of his or her own heart, taking care only that all shall be fully persuaded of the truth of the adage—"Whatever is worth doing, is worth doing well." Of course there are formulæ which are more or less, especially less, adhered to; and I may say that the tones I saw produced during my visit, and which really left nothing to be desired, were got by ordinary lime water, gold, and acetate of soda.

On one side of the washing-room there is a kind of sink running the whole length of the apartment, and in which are placed ten circular porcelain syphon washers, with the syphons plugged up, or which are not used, changing by hand being preferred. Over each are taps supplying hot and cold water. The other side has a similar sink with hot and cold water taps, but instead of the porcelain washers there is under each pair of taps a glass plate. From each of the taps there hangs a brass tube about two feet long fastened at one end by a universal joint, and at the other terminating in a rose of fine holes.

Mr. Wilson has evidently discovered what many have long suspected—that prolonged soaking is at least unnecessary; and so, with the appliances just described and the knowledge of how to use them, a batch of prints may be toned, fixed, and perfectly washed in a little more than an hour, the *modus operandi* being somewhat as follows:—The prints are toned in a rather subdued light at one end of one of the long sinks, and removed to a small apartment devoted exclusively to hypo. From this they are brought to what I may call the "syringe sink," placed for a few minutes in warm water, and moved about during the whole time. They are treated in the same way to a second water, and then placed one by one on the plate of glass under the rose. The water is turned on, and the print subjected to its action, combined with gentle friction on both sides. When the whole batch has been thus syringed, the prints are transferred to one of the circular washers, where they are treated to six changes of water, generally warm, and kept constantly in motion. I don't expect the twenty-four hours' soakers to believe in this method, but it is the right thing for all that.

A stairway leads from the washing room to the attic, where the prints are dried. It is furnished with two sets of parallel rails about three feet apart, and the same distance from the floor. They run the whole length of the room, and are used to support the cloth on which the wet prints are spread out to dry. I may add that a similar arrangement is in use in the mounting-room for drying the prints after being mounted.

At the end of the drying-room there is a small place in which a large number of lantern pictures are constantly being made. Here I saw two cameras at work, and, as many of the negatives are double, they were using something like stereoscopic glass, making two pictures at a time, and cutting them afterwards.

The only weak point, so far as I could see, about the whole of St. Swithin's, either in work or appliances, was the fact that there was a tendency in the paper slips that are pasted round the transparencies to come off. Since the period of my visit I have got a "wrinkle" that may be of use—not only there but wherever a similar difficulty may have been experienced. It is to use well-boiled flour paste, to which a little rosin has been added.

Where there are so many persons employed, and so much work done, there is, of course, making and repairing of carpenters' work. For this purpose a joiner's workshop has been fitted up, and while there I saw the process of bath construction in full operation. What looked like a half-dressed packing-box of at least $4\frac{1}{2} \times 3\frac{1}{2} \times 1$ feet had been screwed together, with a portion of a cover about ten inches broad at one end. This was mounted so as to admit of a tilting motion on an equally coarse framework, and the whole of the inside had been thickly smeared over with pitch. When told by the canny, shrewd Aberdonian that it was intended to sensitise the large plates used in the enlarging house, I half suspected he was "taking a rise" out of me, especially as he added that it would take a couple of bucketfulls of solution to cover the plate; but when visiting the enlarging department next day I had evidence that it was just a simple fact, as I saw the bath in use, and perfectly clean negatives as a result of the operation. I suppose there ought to be some truth in the oft-quoted saying that "seeing is believing;" but I confess to doubts not unlike those of the woman rendered classical by *Punch*, when she declared, in reference to *papier moure*, "I'd rather not try it on my cat if I could try it on another."

In a kind of outhouse a few steps below the level of the ground are several large casks, in which the various solutions containing the precious metals are manipulated for the recovery of waste; but, from what I saw, very little is really wasted, and in so far the firm is true to the character so generally attributed to the Aberdonians. How successfully this is accomplished, and at the same time how large an amount of work is executed, may in some measure be conjectured from the fact that the collections of the so-called "waste" silver for last year realised the handsome sum of £202 18s. 10d. It may be a little beneficial to somebody if I also add that during that period the quantity of water actually used was 400,000 gallons.

Taking the photographic establishment of St. Swithin's as a whole, it is certainly the most extensive and complete that I have yet had the pleasure of visiting; and I say with confidence that, whether for the quality of the work, perfection of arrangements, happy, comfortable, and cheerful appearance of the *employés*, or genial courtesy and attention of the principals, there is very little room for improvement. Any one interested in photography having the good fortune to visit the "granite city" will not fully enjoy such visit if he do not at least try to get permission to spend a day at St. Swithin's.

John Nicol, Ph.D.

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PHOTOGRAPHY IN COLOURS.*

As to defining for its practical operation the course of the manipulations one may say that they consist in:—

1. In producing in the camera *clichés* (ordinary three negatives) of the same subject—one by green light, the second by orange light, the third by violet light.

2. In obtaining photographically a red positive image by making use of the first *clichés*, a positive blue image in making use of the second, and a yellow positive image in making use of the third.

3. In superposing the three transparent images, the one on the other, and in blending them mechanically into one single image.

I affirm that this system is the solution at once scientific, artistic, and industrial of the problem of photography in colours.

Scientific.—For it is certain that if a palette of three colours always the same reproduces with an equal fidelity all the subjects in colour, whatever they may be, one cannot qualify as arbitrary the choice of these three colours. Whether this choice results from the rigorous laws of science or from simple experiment it matters little in the two cases; it justifies itself by the results, where one ought to see the brilliant manifestations of an optical law and of a law of the first order.

Artistic.—For the simplicity of the palette explains the inimitable harmony, vigour, and softness—in one word, the artistic beauty of the heliochromic pictures due to the system if they are only a moderate success. The same pencil which is used so largely for transferring what is called the total effect sharpens itself and draws out into a point more sharp than the graved to copy scrupulously the particular shade of the most imperceptible detail. It has in the infinitely little an exactitude, an incomparable loyalty, which takes nothing of its fulness for the work of the master.

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* Continued from page 153.

Industrial.—For the celebrated works of MM. Edmond Becquerel, Niepce de St. Victor, and Poitevin have proved that a plate prepared with a sub-chloride of silver is susceptible to the greater part of the colours of the image formed in the camera, and that it retains that impression, but always shaded from the light of day. Admitting that we could achieve the fixing the heliochromes thus obtained do not respond sufficiently to the exigencies of our present industries, accustomed to the prodigies of the press and to the indefinite multiplication of a work of art, they require in effect as many exposures in the camera as the number of proofs of the same subject that would be required. Our heliochromes, on the contrary, are obtained from moulds or *clichés* created once for all; that is to say, they lend themselves to unlimited copies, which is actually the condition of all graphic arts. As to the necessity of a triple printing for each proof, that is only a small embarrassment; in the actual state of the plant it is not three printings which are required for a chromolithographic print richly shaded, but twenty, twenty-five, and even more.

I have given the general description of the system. I will now describe the practical means I have employed, and which are very subsidiary if we compare them to the system itself, and also admit for the most part of numerous variations.

2. *Production of Three Heliochromic Negatives on Glass.—Operations.*—At the time when I essayed for the first time to put in practice this system photography knew but one sort of negatives—those which are obtained with the white light—and it might have appeared foolhardy and even absurd to found, as I did, the photographing of colours on the employment of three negatives, of which one should be the work of green light and another the work of orange light, practitioners holding generally for certain that neither one nor the other of these two lights would be able to give a proof in the camera. The result of this attempt, hazardous as it might appear, responded to my expectation. I did realise, without much experiment, the three impressions wished. They were negatives on paper, with bromide and iodide of silver formed by the light only; that is to say, without recourse to the processes of development, and that I led by intensifying to the intensity wished when the silver salt had been dissolved by the fixing agent. I will explain further on why at this primitive period of my work I had renounced the usual method, which consists in developing the latent image. The method that I followed offered, amongst other inconveniences, that of an excessive duration of the exposure, and out of all comparison with the exposures known. To get rid of this inconvenience I imagined a process which consisted in contenting oneself with an impression on glass, produced, as said, by the light only, and scarcely visible, obtained consequently with an exposure very much diminished; then to draw from that impression a proof of suitable strength, either by means of a single countertype, giving by contact the image of a single jet, or by means of a regular succession of countertypes, always by contact and of a progressive intensity. It is thus that a layer of gelatine on glass, sensitised with perchloride of iron, exposed and treated notably by gallic acid, gave me at once, placed in contact with a negative nearly invisible on coming from the camera, a negative countertype, of which the energetic intensity, according to a law of optics conformable to my suppositions, was just proportional to the thickness of the layer, and thus allowed the regulations of the strength of this new species of development. As to the successive countertypes, they were furnished to me by those preparations of gelatine, with salts of silver, of uranium, &c., which create by light only effects of contrast, of which the progress is watched in the same manner as we watch the process of ordinary positives (example: a mixture of albumen or gelatine spread upon glass and treated in a bath of silver, with acetate of lead added). If I thus enter into several details upon a process which has cost me years of research, it is that even today under certain circumstances which have become, it is true, exceptional, it might still render some assistance for the heliochromic negatives.

The long study which I have made of the countertypes of which I speak did not prevent me from accomplishing other works in view of a solution less complicated of this difficulty; they were not barren. I had the satisfaction of proving notably—First. That a collodionised glass of iodide or bromide of silver, freed by washing of its excess of nitrate of silver, and exposed dry to anti-photogenic light, gives by development, after a tolerable exposure, an intense image, whilst exposed wet it would not give an image except with white light. Secondly. That by means of an addition of resin to the collodion the glass exposed even wet to anti-photogenic light gives by development an intense image after an exposure not very excessive. I, nevertheless, recognised that these results could only be obtained by observing rigorously the two following precautions:—First. If we proceed by the wet method not to rely to keep the humidity of the glass by adding a hygrometric substance, such as a mixture of albumen and glycerine, which would render the glass absolutely insensible to anti-photogenic light. Secondly. Only to use distilled water for the washings, even for the last washing, the least traces of calcareous salt being sufficient to destroy the sensibility of the glass to green light or to orange light, whilst it is not sufficient to modify in an appreciable manner its sensibility to white light.

From not knowing at the commencement of my experience the necessity of these two precautions, and specially from having used ordinary water, according to the common practice, for the washings which precede the exposure to light, it was constantly impossible for me to see the development even with an immoderate exposure of any impression given by anti-photogenic lights; that is to say, all other impressions than those of objects blue, white, violet, &c. This is why I resigned myself in the early time of my work to proceed by light only, persuaded, or strongly inclined to think, that the green and red lights did not give an invisible image able to appear by the action of developing agents. Having recognised my error, I found myself in possession of continuous methods, above indicated; they were perfectly practicable, and I should have attached them to me in an exclusive manner, if the discoveries of science in the course of late years had not procured me new methods of realising them. Science in effect has recently recognised the great sensibility given to collodion by the rays considered not long ago as anti-photogenic by the introduction of certain substances (chlorophyl, aurine, &c.), of which the absorption bands belong to the slightly-refrangible portions of the spectrum. I set myself to work on this precious information, and I have composed collodions very sensible to the green rays and to the orange rays. I will give the formula of these collodions; they so reduce the time of exposure that all subjects become possible for heliochromic purposes, even the portrait from nature. It is scarcely necessary to say that the descriptions which follow and the descriptions preceding are simply those of some modes of operating—probably very numerous and susceptible of indefinite diversity—by the which my three heliochromic negatives may be and will be realised. I have provisionally adopted the methods in question, with the faculty of modifying them or of replacing them by others, which would be indicated as more rapid of benefiting, in one word, by the conquests which science enriches every day the common stock. Even salts of silver may at any moment be superseded by other preparations.

As in ordinary negatives, we must also in heliochromic negatives distinguish two methods—the wet process and the dry process; some of the preceding details may have foreshadowed this division.

(To be continued.)

Meetings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

The usual monthly meeting of this Society was held on Tuesday evening last, the 3rd inst.,—Mr. J. Glaisher, F.R.S., President, in the chair.

Captain Abney read a short paper on a new method of intensifying negatives. We *hope* to be in a position to publish Captain Abney's paper in our next, but meanwhile may state that the method in question consisted in applying to the fixed and washed image a solution of bromide of copper, followed by a solution of nitrate of silver. Several specimens were handed round testifying to the efficacy of this method of intensification, which he (Captain Abney) said he had been apprised of by Mr. Warnerke.

Mr. Warnerke said he could not appropriate the honour sought to be conferred upon him by Captain Abney, as he had only literally followed a formula published in *Anthony's Bulletin* which he had seen reprinted in the *Photographic News*. He considered the subject as one of great importance, and at the request of Captain Abney he had brought with him the results of numerous experiments illustrating in a very excellent manner the various reactions that had been mentioned. The first was a stereoscopic negative, one half of which had been intensified by the process described. It would be remembered (he said) that to produce this result the photographic image must first be submitted to the action of sulphate of copper and bromide of potassium, by which it was whitened, it being afterwards blackened by the application of nitrate of silver. Numerous other salts had been employed, but nitrate of silver produced the most powerful effect, as would be seen on examining the first specimen shown, in which the effect of chloride of gold and chloride of palladium would be seen. These gave a diminished degree of intensity, with an image of a cold black tone. Chloride of tin acted much more feebly than the others, the effect being scarcely appreciable; while chloride of platinum, nitrate of lead, chloride of antimony, ferridcyanide of potassium, sulphate of iron, perchloride of iron, bichromate of potash, pyrogallic acid, permanganate of potash, and nitrate of uranium had no perceptible action. Sulphantimoniate of sodium (Schlippe's salt) rendered the image red; alkaline pyrogallic acid blackened the image. A third illustration showed the effect produced by the application, to the whitened image, of a mixture of pyrogallic acid with caustic potash, of a solution of nitrate of silver, and of a solution of sulphide of ammonium, each separately applied in different places. From these it would be seen that nitrate of silver gave an image very much more intense than the others. Alkaline pyrogallic acid gave an image of a soft, blackish-grey tone similar to the ordinary negative; while the sulphide of ammonium gave an image of a light brown tint, possessing greater intensity than the former. It would be seen that in every case the whites were preserved clear and transparent. All the three methods were decidedly useful, and could be advantageously employed in special cases. Having thus far found that nitrate of silver gave a better result than other metallic salts, he tried chloride and sulphate of silver together with a solution of oxide of silver in ammonia, with the following results:—While nitrate of silver gave the greatest intensity, chloride was next to it in order. The sulphate produced no action; the ammoniacal salt blackened the image to a very slight extent, but it was unsatisfactory. A fourth illustration showed the effect of the action of various reagents upon images which had been blackened by nitrate of silver. Strong nitric acid destroyed the black colour, but the image still remained of a whitish-grey tint. Strong sulphuric and hydrochloric acids produced no effect whatever. Sulphide of ammonium increased the blackness of the image. Cyanide of potassium reduced its intensity, although not to any considerable extent, the remaining image being of a purplish-black colour. Perchloride of iron destroyed the black colour, leaving the image of a pure pink hue. Ammonia had no action, and that of hyposulphite of soda was very feeble. Having ascertained from Captain Abney's analysis that the black image was composed of silver and bromide, he could not omit pointing out how exceedingly different it was both in appearance and properties from the whitish-yellow bromide of silver so familiar to photographers. In the first place, it was of an intensely black colour; and, secondly, it was insoluble in solutions of cyanide of potassium, ammonia, and hyposulphite of soda.

Captain **Abney** observed that if the blackened image were treated with alkaline pyrogallic acid they would obtain the blackest image he had ever seen.

Mr. **William Bedford** inquired whether the blackened image were permanent, or if it were analogous to that produced by means of mercury, which was very unstable.

Captain **Abney** pointed out that no analogy existed between the two methods, and that the method described by him was quite permanent.

The **President** conveyed the thanks of the Society to Captain Abney and Mr. Warnerke.

Mr. J. H. **Dallmeyer**, having been called upon by the President to open the adjourned discussion on the silver bath, said that he had brought with him a few specimens which would bear upon the subject under their notice. Captain Abney had told them how he had been indebted to Mr. Warnerke for bringing before his notice the intensifier just described; in like manner he (Mr. Dallmeyer) was indebted to the same gentleman for bringing under his notice the pictures sent for exhibition by Mr. Kareline to the recent Edinburgh photographic exhibition—a number of which he had obtained through his agent in St. Petersburg. He (Mr. Dallmeyer) had been informed that the process adopted by Mr. Kareline was at present a secret; the results, however, would speak for themselves. Looking at the pictures from the optician's point of view it was evident that Mr. Kareline was working a process more rapid than any employed in this country; the depth of definition was greater than that usually seen, presuming them to have been taken in an ordinary studio, and under the usual conditions of lighting. From an examination of the specimens he judged them to have been taken with a lens having a focus of about twenty-four inches, with an aperture of $\frac{f}{9}$ or $\frac{f}{10}$, and, as the exposure had been very short, he inferred that the process must be a very rapid one. He also exhibited a large group taken by Messrs. Hills and Saunders, with an aperture of $\frac{f}{6}$, but this picture had been taken in the open air. Some marine views by Messrs. Perkin and Son, Mr. Valentine, Mr. Payne Jennings, and others were also exhibited as instances of great rapidity of exposure. With respect to the condition of the chemicals, Mr. Warren De la Rue had succeeded, some years ago, in obtaining several very fine photographs of the moon. Now as the moon had two motions—one in right ascension and the other in declination—it was necessary, in order to obtain the best possible photographs of that luminary, that the exposure be as nearly instantaneous as possible. In order to obtain such photographs Mr. De la Rue had been most emphatic in asserting that it was imperatively necessary that the silver bath should be quite neutral. He saw present in the room M. Boissonnas, of Geneva, who, he had been told, had discovered a process by which he secured a degree of sensitiveness six or eight times greater than that commonly obtained; and as he had several albums containing groups and other pictures which he had obtained instantaneously, he hoped that the President and members would give a becoming welcome to that gentleman.

The **President** gave M. Boissonnas a very hearty welcome, confirmed by the applause of the members, and, in response to the request of the President, M. Boissonnas exhibited the albums to which we directed special attention in our last number. The process employed by him differed, he said, in certain respects from that in general use, although the routine method of working was similar. For the smaller portraits he had employed a 2B *carte* lens, and for the cabinet portraits a 3B lens, both by Dallmeyer, a foreign lens being made use of for the largest pictures.

Mr. F. **York** then read a brief paper, the purport of which was that since the previous meeting he had been trying numerous experiments with the silver bath, the result being that he was quite satisfied in his own mind that pinholes were not caused exclusively by sulphate of silver, as he had saturated one bath with pure washed sulphate of silver, and to another had added sulphate of potash, both of them working beautifully without a trace of pinholes. He inferred from his experiments that a "sandy bath" might be corrected with nitrate of baryta, and the excess of that salt decomposed by the addition of sulphate of potash, leaving the bath free from this salt as the resulting decomposition was sulphate of baryta and nitrate of potash, or, if sulphate of silver were added, sulphate of baryta and nitrate of silver. We hope to publish Mr. York's paper in our next.

Mr. W. **Brooks** obtained the most rapid bath by adding to old silver solutions sufficient carbonate of soda to cause a dense precipitate. He then boiled the solution. When cold he found it to fog a plate, but he added just enough of nitric acid to cause it to work clear. In this state it would be slightly alkaline and very sensitive.

Mr. J. A. **Spencer** felt indebted to Mr. J. Spiller for pointing out sulphate of silver as the cause of pinholes. He would suggest as a preventive the use of iodide and bromide of barium in the collodion.

Mr. T. S. **Davis**, having referred to the necessity that existed in the days of pyrogallic development for maintaining the bath in a state of neutrality, alluded to the opposite conditions that prevailed with iron development, adducing, as an illustration, the exceedingly acid bath of Mr. Black, of Boston. With regard to pinholes: it had been shown by Major Russell that they were formed by iodate of silver. It was his opinion that the double decomposition arising from the immersion of the plate in the bath took place in the body of the film itself, and the nitrates formed were not washed away in the bath, but remained in the film, influencing the development of the image.

Mr. V. **Blanchard** had only experienced pinholes during the last four years, and he thought that it might be attributable to the fact of a large proportion of the nitrate of silver in use being now made from silver which contained traces of other metals.

After some further remarks by Mr. York, Mr. Brooks, and Captain Verney, the President adjourned the discussion.

Votes of thanks were awarded to Mr. Dallmeyer, to M. Boissonnas, and to Captain Verney for the exhibition of several fine collections of photographs. The next meeting will be held on Tuesday, the 8th of May.

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EDINBURGH PHOTOGRAPHIC SOCIETY.

In consequence of the time occupied in connection with the recent exhibition, the ever-attractive entertainments, under the title of "popular evenings," which have long been an interesting feature in the operations of this Society, have not been commenced at such an early period of the session as heretofore.

The first took place at Queen-street Hall, on Wednesday, the 28th ult., and, notwithstanding the inclemency of the weather, there was a large attendance. The exhibition consisted of a fine series of transparencies by Messrs. G. W. Wilson and Co., of Aberdeen, Dr. John Nicol being the lecturer.

Dr. **Nicol** began by saying that the selection of "a visit to Aberdeen and its surroundings" as the subject of the first popular meeting had arisen out of a very pleasant sojourn which, along with the treasurer, he had recently made in the "granite city," and paid a warm tribute of praise to the city itself and to its inhabitants generally.

The first object of interest exhibited on the screen was *Dunotter Castle*, then, getting nearer Aberdeen, two views of the city from the chain bridge and Balnagask respectively; and, next, a large series of pictures of the principal streets and buildings. Proceeding northward, in the direction of Peterhead, the *Brig of Balgoni*, the *Bullers of Buchan*, *Inverogy* and *Ravenscraig Castles*, were shown and briefly described. Returning to the Bridge of Dee, a series of fine pictures of the district known as "Deeside," and extending from Aberdeen to above Ballater, was exhibited and commented on till the lecture was brought to a somewhat sudden termination by the exhaustion of the supply of oxygen, although the light had only been burning for a little over an hour.

This mishap, it turned out, arose from a leak in the gas-bag, and ought to serve as a hint to exhibitors to look to their apparatus, especially after it has been unused for a season.

The exhibition, however, notwithstanding this little drawback, was a decided success, and as a proof that the committee appointed to organise these "popular evenings" are anxious to make up for lost time, we may say that tickets for another, *The Arctic Expedition under Captain Nares*, are issued for Wednesday next, the 11th instant.

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GLASGOW PHOTOGRAPHIC ASSOCIATION.

The usual fortnightly meeting of this Association was held on Wednesday, the 28th ult., in the rooms of the Religious Institution, Buchanan-street,—Mr. Urie, in the absence of the President and Vice-Presidents, occupying the chair.

The minutes of the previous meeting having been read and adopted, and there being no questions, the correspondence was read.

Mr. John Parker was then called to read his paper on *Landscape Photography*. [See page 160.] Mr. Parker exhibited a large number of specimens of his work, described his tent (which he had brought with him to the meeting), and his *modus operandi* generally.

The paper was listened to with great attention, and the members were unanimous in considering his pictures beautiful specimens of the art, and his field tent an exceedingly simple, portable, and efficient one.

Mr. STEVENSON said he had listened with very great pleasure to Mr. Parker's able paper; and instead of the essayist being, as he (Mr. Parker) thought out of place in giving his experience before gentlemen who, perhaps, did in a week as much work as he himself did in a year, he had shown himself to be an extremely able photographer in his own particular line, capable of producing work of rare excellence—so excellent, indeed, as to merit the medal offered by the late Edinburgh exhibition committee for the best landscape work by amateurs. His paper was also exceedingly interesting, and contained a good deal of useful and valuable information, while, further, it described a phase of photography in which, perhaps, the greater number of the members had little or no personal experience, their work being mostly of the studio or portrait kind. The specimens exhibited that night were undoubtedly works of art, and he was sure the Association felt proud of Mr. Parker as a member. He congratulated him on his success and the honour justly done him by the awarders of the prizes at the recent Edinburgh exhibition.

Mr. GILFILLAN thought, with the previous speaker, that the Association ought to be proud of Mr. Parker, and considered that the reward he had obtained at the late exhibition and the flattering notices his work had received in the journals were only his due, as his specimens were certainly of a very high artistic order. Mr. Parker had shown himself to be not only the possessor of the necessary photographic apparatus, but an artist in the true sense of the term, having that "something" within him which at once showed the vast difference between the mere mechanical, manipulative operator and the true artist. Personally he (Mr. Gilfillan) would like to be the possessor of an example of Mr. Parker's handiwork—a feeling, he thought, many of the members might share with him, and he would suggest that Mr. Parker should lend one of his negatives to the Association, so that prints might be got therefrom. If the members had one of Mr. Parker's specimens beside them they might prove incentives to good work—a standard for them to try and equal—and give them a more intense desire to strive after what was really true, good, and beautiful.

Mr. MCPHERSON considered Mr. Gilfillan's suggestion a good one, and believed the members would be only too glad to get a print from one of Mr. Parker's negatives. He suggested that the negative be given to Mr. Stuart from which to print copies.

Mr. TANNAHILL thought that in the proper printing and toning lay a good deal of the beauty of Mr. Parker's specimens, and considered that many portrait photographers would be quite unable to produce such beautiful results from his negatives as he could himself; he would, therefore, suggest that the printing be left to Mr. Parker. That gentleman, he thought, had given a good lesson to many professional landscape photographers as regarded the production of views with cloud effects. Many of the latter gentlemen's work, as Mr. Parker had pointed out, were almost spoiled for lack of cloud effects; and he thought that the union of landscape and sky in the specimens shown was most beautiful, enhancing their effect considerably.

The CHAIRMAN thought it too much to ask Mr. Parker to give both negatives and prints, and considered it would be better to pay one of their professional brethren who did something in landscape photography, and would be able to do them proper justice, for printing off a number of copies for those members who might desire to possess one. The paper he considered a most able one, both from a photographic and literary point of view—the best, indeed, that had yet been read before the Association. Of the specimens he could not speak too highly, their aërial perspective surpassing anything he had hitherto seen, while they were also extremely clear and sharp all over. The cloud effects were admirable and well chosen; in that alone Mr. Parker had shown his artistic talent. Many scenic views he had noticed were often spoiled by the clouds not being in proper harmony with the landscape, the lights being often printed in the opposite direction from that in which they had really fallen upon the scenery, and he could recommend Mr. Parker's method of printing-in cloud effects as a good one, giving great command of effect to those who "go in" for that kind of work. He proposed that a hearty vote of thanks be given to Mr. Parker for his exceedingly able and interesting paper, for his trouble in bringing such a number of beautiful specimens, and for his description of his method of working and of his apparatus.

Mr. PARKER thanked the members for the manner in which they had received his paper, and pointed out that, being an amateur who only practised during his leisure hours, which were exceedingly few, he would be quite unable to print off copies from his negatives for the members; but he expressed his willingness to hand over any of his negatives to a professional gentleman, who might print off the desired number of copies.

Mr. DODDS asked how the pictures in the frames were mounted—were they attached to the glass?

Mr. PARKER explained that some of them were attached by a thin, transparent gelatine. They were the first he had tried that way, and a bell here and there was to be seen; but he was now able to obtain them perfectly free from that defect. The mounting of the prints in the manner described was a good idea, he thought, giving them greater brilliancy than could be got otherwise.

This being the meeting immediately preceding the annual one, according to Rule VI. the nomination of gentlemen to fill the various offices of the Society becoming vacant by the retiring of the present directors was proceeded with, a number of gentlemen being proposed and seconded. Some arrangements were made for a magic lantern entertainment to be given to the members and their friends on an early date.

The committee on carbon patents submitted a circular which they had got printed and circulated This was read, and members expressed their approval of this part of the committee's work.

Mr. JOHNSTON made a few remarks regarding his bromide emulsion process, and exhibited a few negatives and transparencies taken by it. This concluding the business, the meeting was brought to a close by a hearty vote of thanks being awarded to the Chairman.

Correspondence.

GELATINE EMULSION.

To the EDITORS.

GENTLEMEN,—I have not been able to account for the change in the gelatine emulsion prepared with zinc bromide, to which I called the attention of your readers in a letter published last week. The addition of half-a-grain or so of silver nitrate to a zinc emulsion after washing does not make it more sensitive, but rather less so, the plates working cleaner.* This last result is especially curious—so utterly unlike our experience with collodion emulsion.

I have prepared another emulsion with the zinc bromide, using nitric acid, with a view of changing the nature of the silver bromide. I also used half the quantity of gelatine and double the quantity of zinc bromide, sensitising with one grain of silver nitrate in excess. The emulsion is quite as sensitive as the zinc emulsions I have referred to, and is not subject to the discolouration to which the other zinc plates are so liable. I really can hardly call the stain a "developer stain," as, on a late occasion, when using a developer mixed with ammonium sulphate (of which more anon), I could see that the "stain" was produced before the developer had appreciably discoloured. The emulsion prepared with the acid gives plates having a brown image and a primrose-coloured sky by reflected light. I think this is the first time I have seen this effect after using the hydrate developer; with the carbonate this result is usual. Now, why are the plates prepared with the emulsion made with nitric acid free from the stain to which the other zinc plates are liable?

I find that a solution of magnesium sulphate (as recommended, half-an-ounce to a pint) is not suitable for using with gelatine plates; that is, if the discolouration of the developer be objected to. It has a strong oxidising action on the pyrogallic acid when the ammonium hydrate is added—I suppose through the formation of magnesium hydrate. I have tried the ammonium sulphate, and find that it acts in exactly the opposite way; both the development of the image is retarded, I may say prevented, and the developer remains uncoloured for a considerable time. I intend to try the ammonium nitrate; this will not interfere with the silver developer.

From what I have seen of the action of the sulphates I have been led to one of two conclusions:—Either that they have some action on the gelatine film, which does not appear likely; or that the films are more liable to blister from inequality of density while in the alkaline state. At anyrate I have often found a plate soaked and developed with the sulphate blister when rinsed with soft water; but, if the plates are washed in the "salted" water, they do not seem afterwards liable to blister, however suddenly the density of the liquids may be altered. For instance: the fixing solution never causes blisters when ordinary water is used. Can any of your readers help us to a correct view of the precise mode of action of the "Epsom salts?"

The zinc collodion emulsion, which had been kept with silver in excess for a week, now, after the addition of iodine solution and keeping, works cleanly, and is, perhaps, slightly more sensitive than the other. I have also not experienced a split film since those described in my communication to this Journal. The addition of gum ammoniacum I find to be a great aid in keeping the films on the plates.

I have modified the developer since I last wrote. I now use, for a quarter plate, a quarter of a grain of pyro. to two drachms of water. I pour this over the plate, but it does not generally bring out the image. Four drops of a 1 : 8 solution of ammonia are then added, and the whole returned to the film. When the developer has taken effect on the whole surface of the film, pour it into the cup, and examine the character of the image. If the exposure has been right no bromide will be required; but if the image appear hazy and grey add the bromide solution. I get ample density with this developer; indeed I reduced the pyro. with the idea of obtaining greater delicacy. It is probable that a drop or two of restraining bromide would be necessary when working with a larger quantity of developing solution.

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* I gave an account of this action of silver nitrate on an emulsion prepared with ammonium bromide in the third paragraph of a letter published at page 275 of the last volume. "Franklin," also, has pointed out that a large excess of silver conduces to lower the sensitiveness.

I can highly recommend Captain Abney's formula for emulsion to those who wish for a process combining the following qualities:—Rapidity combined with clearness and density, latitude of exposure, and very great freedom from blurring.—I am, yours, &c.,

Cotheridge Court, Wocester, Herbert B. Berkeley.
April 2, 1877.

◆

THE BARYTA BATH.

To the Editors.

Gentlemen,—Mr. Spiller, in his paper on the *Nitrate Bath,* says:—"Mr. A. L. Henderson must have been aware of the general occurrence of the sulphate of silver when recommending the addition of the nitrate of barium to the bath solution." Such was the case, and I tried the barium in the collodion; but I did not find it so advantageous as adding it to the bath. Knowing that many photographers have objections to trying new things, I suggested the use of barium to a celebrated collodion maker as well as to a manufacturer of nitrate of silver. Whether they have taken the hint or not I am unaware.

One curious thing with the baryta bath is this:—Suppose you start with a thirty-grain solution of silver to which is added the nitrate of barytes and iodide of potass in excess (to thoroughly iodise the bath), the excess of iodide of silver being left in the filter, and you continue to use the same bath day after day, filtering through the excess of iodide left in the filter, but keeping up the quantity of solution by adding fresh silver solution (also thoroughly iodised and barytified), it will be found that the iodide of silver has become redissolved in the filter; so it will be necessary to convert or add more to supply the exhaustion.

Can any of your readers explain why, if a bath be fully saturated with iodide of silver, it should sensitise a collodion plate without any precipitate in the solution taking place? I am well aware of many theories in this connection, but I cannot quite reconcile them.

Concerning the ferro-silver bath which I wrote about in the Almanac, I have not had time to work it out; what I intend to add is zinc and copper. My object will be apparent to many of your readers.—I am, yours, &c., A. L. Henderson.

49, *King William-street, E.C., April* 2, 1877.

P.S.—If a collodion or other plate be sensitised in a bath of silver, iron, copper, and zinc, then exposed, and afterwards replaced in the sensitising bath and an electric current applied, would an image be developed?—A. L. H.

◆

CARBON LICENSES.

To the Editors.

Gentlemen,—Will you permit us briefly to reply to the letters of Messrs. Henderson and Elliott in your last issue.

We beg to call their attention to an advertisement from our solicitors, and to say that, sorry as we should be to disturb the good understanding that has hitherto existed between the photographic profession and ourselves for many years, we shall certainly take proceedings against any person or persons who either manufacture tissue for photographic purposes, or who sell or use such tissue (not being of our manufacture), or who employ the double-transfer processes without our license or consent, during the duration of our patents.—We are, yours, &c., The Autotype Company.

April, 4, 1877.

To the Editors.

Gentlemen,—Being directly appealed to in your Journal respecting the meaning of the words "no license required," I will, with your kind permission, say a few words.

Until this week any man could go to the Autotype Company and there purchase, unquestioned, material with which what are known as Lambertype portraits can be produced. Not a word was asked about a license. If the purchaser asked or wrote for *Lambertype* tissue he was told it was only supplied to licensees, but he could be supplied with *portrait* tissue. This was simply the same tissue without the Lambertype label.

I enclose you a sample of "Lambertype tissue," and a sample of tissue sold to a person who was told he could not have it (the Lambertype tissue), not being a licensee. They are identical—experts are agreed on this. Persons in all parts have bought and used tissue without a license. Not in large quantities; for, unfortunately, the lack of practical demonstrations has prevented more than a very few from acquiring Lambertype knowledge.

A friend of mine—a leading photographer of the highest standing in a northern city—saw them about printing his portraits in carbon. They had sold the exclusive right for the city and could not grant him a license, even if he were willing (which he was not); but they undertook to supply him with materials for carbon pictures, in the face of the fact that they had sold the *exclusive right,* and they *are* supplying him. I enclose you the names and addresses and a sample of the tissue supplied. Compare this tissue with the Lambertype and say what is the difference. There is practically none. Every word of my statement, that no license was required, was absolutely true.

Such an incident as has now arisen would not be complete unless there were a comic side to it. This is duly supplied by the editor of a contemporary, who in last week's issue says:—"We are bound to say, from a careful consideration of the facts, that carbon printing has been advanced rather than obstructed by the existence of the patents." Then it must be true that this worthy gentleman is altogether behind the day. Ten years since his opinion had weight, and he was the centre of a circle of prominent and leading men, but reports must be correct that this is all of the past. Where can his eyes be? It is two years since M. Lambert introduced the greatest modern improvement in photographic printing, and ample time has passed for all to be now using it, and for silver to be a thing of the past.

The company has had the monopoly; no one has interfered with them, and how many in England and Scotland are now issuing their work in this way? Are there twenty, thirty, or forty? I have gone into this matter with a gentleman—an ardent carbonist—who knows more photographers than anyone else, and we could not make out that nearly thirty were issuing their work in this way. In London, Manchester, Glasgow, Birmingham, and most of the other large centres next to nothing is being done. Your contemporary's law seems to be as reliable as his other opinions. Does he not know that when Mr. Spencer made tissue the company never ventured on legal action, but after storming for months took him into partnership? Their present action in refusing to sell tissue to non-licensees will of course practically cut off carbon work from a large number of photographers, and prevent experimental trial.

I will just sum up in a few words the substance of this letter:—1. Until this week any one could buy tissue and print without a license. 2. The same tissue is supplied to licensees and non-licensees, one having a Lambertype label and the other not. 3. Where exclusive licenses have been sold competitors without licenses are supplied with materials for producing the same results. I place in your hands names and other evidence of above.—I am, yours, &c., Samuel Fry.

April 2, 1877.

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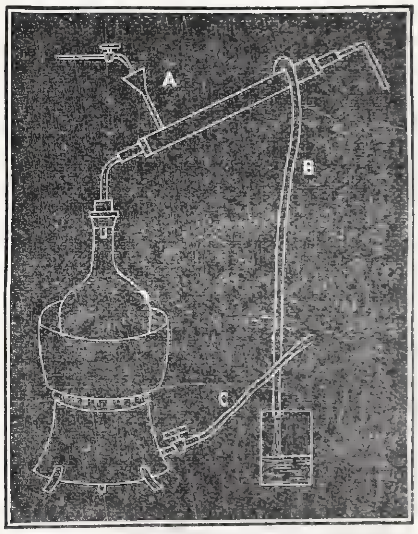
THE HYDROSULPHITE DEVELOPER.

To the Editors.

Gentlemen,—In my letter of the 11th March, published in No. 882 of The British Journal of Photography, the names of "tincture of quinine" and "tincture of catechu" have not been well chosen, and have given rise to a misunderstanding, to remove which is the object of these lines.

Tincture of Quinine (*teinture de quinqnina* of the French) is a preparation made in the following way:—Ten grains of Peruvian bark (*cinchona calisaya*)—for photographic purposes, grey bark (*C. micrantha*) is to be preferred—are boiled for some hours with one ounce of weak alcohol (sp. gr. ·090) in a digester apparatus, known here under the name of "*appareil à deplacement,*" consisting of a Florence flask with a glass tube immersed in cold water, and so placed that the condensed alcohol flows back into the flask. A certain quantity of alcoholic vapour escapes condensation, and when the liquid in the flask has been reduced to half its original volume the operation is terminated. After cooling the solution is filtered and kept for use. When added to water a dense precipitate is formed, and the aqueous solution contains principally quinotannic acid ($C_{18}H_{16}O_{14}$), a small quantity of quinic acid ($C_{14}H_{12}O_{12}$), together with alkaloid salts (quinine, quinidine, cinchonine, &c.), the acids being either free or combined generally with lime.



A Cold water. B Warm water. C Gas.

Tincture of Catechu (*teinture de cachou*).—Macerate for five days ten grains of catechu (extract of the wood of acacia catechu) in one ounce of weak alcohol (sp. gr. ·090); then boil it and filter. Insoluble substances are separated when the tincture is poured into water. When removed the solution contains a large quantity of cachou tannic acid and a minimum proportion of catechine. Some other, not yet determined, extractive substances are also present.

These two solutions are obtained ready made at the chemists'. The preservative prepared therewith is of a yellow colour, which, in time, changes into a red tinge—due to the oxidation of the catechine and the cachoutannic acid—but retains its photographic qualities.

The formula of preservative I have given is only an average one, which is to be altered to suit the subject; for instance, for a distant view, looking over landscape or sea, the catechine must be reduced and sometimes left out altogether. On the other hand, for near objects it must be increased, the quality of quinine tincture remaining the same.

Occasionally it will be found beneficial to reduce, at the same time, the relative proportion of quinine.

I think I have found in the addition of five grains of borax to one ounce of the soda bisulphite stock solution a means of delaying, for a long time, its decomposition and the liberation of sulphurous acid; but my experience with this modified solution is not of a sufficiently long standing to permit me to form an opinion as to its suitability and to warrant its action. Apologising for trespassing on your space,—I am, yours, &c.,
L. O. Sammann.

43, *Avenue du Bois de Boulogne, Paris, April* 2, 1877.

◆

ILLUSTRATIONS OF PINHOLES AND OTHER DEFECTS.

To the Editors.

Gentlemen,—Will you permit me to suggest that, by way of illustrating the subject under discussion at the meetings of the Photographic Society of Great Britain, some of our friends would perform an act of kindness, and at the same time help to elucidate the matter, if they would exhibit some specimen negatives showing the character of the defects now brought before the notice of the Society; there could then be no misunderstanding regarding these plague spots. There are pinholes and pinholes, spots and spots, comets and comets; it would be well to have these diseases properly classified for the purpose of easy recognition, or, in speaking of pinholes, one person may mean one thing and another something quite different.—I am, yours, &c.,

10, *Pall Mall, S. W., April* 4, 1877. R. W. Thomas.

◆

EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale*, that being done at a small cost in our advertising pages. This portion of our columns is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

First-rate *carte* lens, by Alex. Gaudin; will exchange for 10 × 8 air-tight bath and 1-1 square camera.—Address, Argent, 68, New-street, Ashford.

A good 16 × 13 rolling-press offered in exchange for head-rest (Hanson's), cabinet hot press, or 10 × 8 view lens.—Address, J. M'Farland, 20, Glen-street, Edinburgh.

Portable box dark tent, with strong tripod stand, in exchange for 15 × 12 glass bath, rolling-press, or half-plate bellows camera.—Address, R. Pringle, Tanfield, Edinburgh.

◆

ANSWERS TO CORRESPONDENTS.

Photographs Registered—

G. Bremner, Banff.—*Two Portraits of Thomas Edward.*

Squire Knott, Oldham.—*Portrait of J. T. Hibbert, M.P.*

Edwin Debenham, Weymouth.—*Portrait of the Venerable Archdeacon Townsend.*

☞ *Correspondents should never write on both sides of the paper.*

Notice.—Each correspondent is required to enclose his name and address although not necessarily for publication. Communications may, when thought desirable, appear under a *nom de plume* as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

C. F. C.—Next week.

G. Leach.—The specimen is excellent.

Clericus.—The address, "Reigate, Surrey," will prove sufficient.

C. J. Witcomb.—Thanks for the two *cartes.* They are brilliant, and the tone is excellent.

R. P.—India-rubber rollers may be obtained from several firms in London who supply printers' requisites.

J. S. (Heaton Mersey).—The millboard enclosed is *much* thicker than that employed as the shutters in the scenograph slides.

Cygnus.—A stereoscopic lens of short focus will answer *better* for photomicroscopy than the four-inch power of which you speak.

W. D. Stone.—An excellent and practical series of articles on the colouring of lantern transparencies will be found in our volume for last year.

Alfred.—No special care is required in the preparation of ordinary litmus paper; but it is necessary that the paper be of a soft, absorbent nature.

R. Eaton.—You cannot go wrong with either of the lenses mentioned. Camphor is only sparingly soluble in water, although exceedingly soluble in alcohol.

W. T.—Procure a firm retort-stand having three rings with very strong screws to each. You will by means of such a piece of apparatus be better enabled to carry out your ideas than by the method indicated in your letter.

A. J. C.—The sensitised paper to which you allude is altogether unsuited for producing an enlargement by development. For this purpose you must make use of an iodised paper sensitised with aceto-nitrate of silver, exposing it while wet.

J. C. H.—1. In reply to your first question, we must refer you to the catalogues of the respective makers named. There is very little to choose between them.—2. It will afford us much pleasure to introduce your camera through the mediumship of the societies, and we have no doubt that the public will appreciate your invention.

P. G. A. would like to know (if any one can inform him) the cause of photographs, which have been mounted with freshly-made Glenfield starch and on the best French-toned mounts (chocolate lines), apparently the same as used for years from the same firm, coming out soon after mounting in a mass of yellow spots. Washing, fixing, and drying have been especially attended to.

J. W. F.—The condenser is rather small; but by care in having the light properly centered it will answer quite well for enlarging *carte* negatives of the usual dimensions. In reply to your second query: of the various forms of "simple" condensers we prefer that introduced by Herschel. See some observations on this topic in an article devoted to the subject in our last Almanac.

Alf. G. Pettitt.—The appearance of the spots indicates the presence of lime, probably in the washing water. The same effect would be produced by particles of bronze powder. Indeed, on comparing the spots in your prints with some that we *know* to have been caused by bronze powder we are quite unable to perceive any difference. We do not think that the mounts are to be blamed in this instance.

Old Subscriber.—You may, in the following manner, construct a prism by which useful experiments in spectrum analysis can be made:—Obtain a short and well-stoppered two- or three-ounce bottle and grind away two sides (if such a term be here admissible), so as to form an angle. Cement upon these sides flat plates of glass, so that the bottle shall be quite tight, and then fill with bisulphide of carbon. Numerous prisms for spectroscopes are constructed in this manner.

L. D. (Charente).—There is excellent gradation in the little landscape, but a pigment having a warmer tone would have been desirable for such a subject. Our correspondent says that the picture which has elicited the above remarks, and which was enclosed in his letter, was "sensitised in a bath which is not new, but is not in general use. It is as follows:—Ten parts of bichromate of potash are dissolved in one hundred parts of hot water, and then liquid ammonia added until the colour of the solution becomes pale yellow. When cold I add to it forty parts of alcohol. The addition of alcohol is due to M. L. Boivin, and mentioned in the *Moniteur de la Photographie.* The paper sensitised in this bath gets dry in one one night in a room not at all warmed during the coldest and dampest weather, and in a heated box it may be dried in about half-an-hour. The solution keeps good till the last drop. I have a bath made in October, 1875, which gives now as good prints as a new one. When the alcohol is added to the solution it gets much warmer and the colour a good deal deeper."

Received.—M. Leon Vidal's *Agenda Photographique*, and *Photographie au Charbon.* Also, *Photographisches Jahrbuch* (Dr. Hornig), and *Agenda-Formulaire de L'Association Belge.*

◆

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
April 11	Glasgow Photographic Assoc. ..	Religious Institution Rooms.
,, 11	Cheltenham Amateur Photo. Soc	Savings' Bank.
,, 12	Manchester Photographic Soc. ..	Memorial Hall, Albert-square.

◆

METEOROLOGICAL REPORT,

Observations taken at 406, Strand, by J. H. Steward, Optician.

For the Week ending March 27, 1877.

These Observations are Taken at 8 a.m.

March.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks.
22	29·70	W	33	35	48	30	Foggy
23	29·79	W	33	35	48	29	Foggy
24	29·31	NW	38	40	53	32	Cloudy
26	29·17	SE	45	47	48	42	Dull
27	29·30	WSW	42	44	—	42	Dull
29	29·91	SE	46	47	53	44	Raining
30	30·05	NW	46	48	59	41	Cloudy
31	30·15	W	45	47	55	40	Fine
April.							
2	30·01	NW	43	47	58	43	Cloudy
3	29·55	S	48	51	58	45	Cloudy
4	29·20	SW	50	54	62	50	Cloudy

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 884. Vol. XXIV.—APRIL 13, 1877.

ON VARIOUS APPLICATIONS OF COLOURED MEDIA.

From time to time, and for various purposes, it has been suggested to employ coloured media through which the light is filtered (if we may use the expression) previous to exerting its influence on the sensitive film, in order that certain special effects may be produced; and the publication of M. Ducos Duhauron's system of photography in colours, and the use made by that gentleman of such media, brings the subject into prominence at the present time. It would be impossible within the limits of an article like this to treat of the whole of such applications; we purpose, therefore, to touch upon a few of the principal ones, in their theoretical as well as practical phases.

The most important, perhaps, because it is even now still under discussion, is the proposed employment of violet glass in the studio in place of the colourless glass in general use; but as this has been recently so fully discussed in our own columns, as well as elsewhere, it will be unnecessary to give further attention to it here. Another application—also at no distant date the subject of considerable discussion—is the employment of coloured glass for the purpose of giving to the sensitive plate, either during or subsequent to exposure in the camera, what has been termed "auxiliary lighting," whereby it is claimed that the time of exposure is considerably reduced. A third plan consists in the interposition of various coloured glasses between the lens and the landscape during outdoor exposures, for the purpose of securing a more harmonious rendering of foliage and other objects which, from their colour, are imperfectly represented under ordinary circumstances. Again: we have the use of screens of various colours in connection with the production of prints from defective negatives, the object of which is to modify the gradations and even the *tone* of the resulting print. Finally, but this we do not at present intend to discuss: we have M. Ducos Duhauron's adoption of coloured screens in the production of the three "monochromes" which combine to form the photochromic proofs obtained by his process.

Before considering the probable effects of any of these arrangements it will be necessary to distinguish carefully between light and colour, and between the results due to actinic action on the one hand and chromatic influences on the other. It will also be necessary to recognise the fact that, whatever the influence exerted, the result is recorded in the same terms—light and shade—whence arise the anomalous pictorial effects so common in photography. Recent researches have made it plain that there exist two distinct forms of sensitiveness, and that though under ordinary circumstances the sensibility of our films decreases in the direction of the less-refrangible rays of the spectrum, it is possible by the employment of certain substances to reverse the order of impressibility, or to fix its maximum in almost any portion of the spectrum. The former effect is due to actinic, the latter to chromatic, influence. In the present state of our knowledge, however, we are compelled to represent the two effects in identical terms; and for all practical purposes various colours and their gradations are equivalent to variations of light and shade, or, in other words, to variable proportions of the force known as "actinism."

We are compelled to notice the existence of this difference of action, though it does not, strictly speaking, come within the scope of the present article, in order to explain that what appears theoretically anomalous is not necessarily so in practice; for, in view of our inability to render colour by colour, it becomes important to translate chromatic into actinic effect. In this manner we are enabled, in the case of the yellow and red rays, which are almost wholly devoid of actinic power, to secure an effect in monochrome more nearly approaching their colour-value to the eye; and we have no doubt that when the various methods, chemical and mechanical, by which such a result is to be secured shall have been more thoroughly investigated, a great improvement in our pictorial representations of nature will ensue.

We may recognise two distinctive actions in the employment of coloured glasses for any of the purposes we have mentioned above; but it does not necessary follow that they are both brought into play at the same time. First, as regards actinism: it is obviously impossible to add to the actinic power of light by passing it through a coloured medium, as has been supposed to be the case by some, and practically we are unable to obtain by artificial means a colour of sufficient purity to permit the passage of the whole of the actinic rays; hence it follows the interposition of any coloured glass whatever must inevitably result in a diminution of the active powers of the transmitted light. Again: we know that actinic action is not confined to the violet end of the spectrum, but extends as low as the green rays—that is to say, all the rays as far as a certain point are capable of exercising a chemical action upon the photographic film. Now, it is evident that on employing a medium which transmits the rays of one particular colour only and cuts off the remainder we reduce the actinic power to the level of that ray and limit the chemical action to that colour, and thus we have the power of destroying the force of the most active portion of the spectrum without materially affecting the less refrangible portions. In practice, however, the media employed are not sufficiently pure to confine the transmitted rays to a single colour, but permit the passage of a certain quantity of the rays adjacent. In this manner we secure an effect which may be set down in part—at least—to the action of the colorific rays.

Let us now consider the application of the preceding remarks to the individual uses to which coloured glasses are put in photographic operations, taking them in the order they are mentioned above. The method of auxiliary lighting consists in submitting to the action of light, under a coloured glass of suitable colour, a plate which has received a reduced exposure in the camera; or the front of the camera may be fitted with windows of coloured glass, in which case the regular and auxiliary exposures take place simultaneously. It is difficult to explain the alleged gain in rapidity thus secured by any action due to chromatic influence, especially as the effect is not confined to any particular colour, though green is usually recommended. The latter fact, as we shall show, rather lends support to the view that the action is due to actinism. A similar result is secured by exposing the plate for a brief period, after its removal from the camera, to a feeble artificial light—such as an ordinary candle—in which case the effect is plainly due to actinism alone. The *rationale* of the system has been explained by supposing that the most feebly-impressed portions of the picture are incapable of development owing to some resistance exercised by the organic matter of the film; but the impression made by the auxiliary exposure (itself incapable of development), added to the original effect, brings the feeble detail within the scope of the developing solution, and, without producing fog on the transparent portion of the negative, enables us to bring out detail otherwise unattainable. This would explain why green glass, which permits the passage of a small portion of the actinic rays, is preferable to yellow or orange, which arrest nearly the whole.

We next have to deal with the interposition of coloured glass between the lens and the subject for the purpose of bringing into prominence any particular colour otherwise imperfectly rendered.

As a type of this class we may select the employment of green glass in landscape work in order to secure a more perfect representation of foliage. In this case it is obvious that we arrest a large portion of the actinic rays and greatly increase the exposure necessary, in which theory and practice agree. But if this were the only action the result would be the opposite to that desired, as the feebly-lighted portions would be the ones to suffer most from the loss of actinism. If, however, we take into consideration the chromatic transparency of the interposed screen, we shall find that, while the green rays suffer but little loss, the blue and higher portions of the spectrum are considerably depreciated in actinic value; in fact, were it possible to obtain a green glass of sufficient purity of colour they would perhaps be entirely annihilated, and rendered of equal value with the orange and red rays. Practically, the green glass usually met with will be found to transmit a considerable proportion of the blue and yellow rays in addition to the green, and it thus occurs that we are able to prolong the exposure sufficiently to fully impress the foliage portion of the picture, at the same time lowering the force of the lighter parts sufficiently to prevent over-action. The same principle holds good where the subject to be reproduced consists of an oil painting or other coloured picture in which colours of low refrangibility prevail, but in employing yellow or orange glass it must be borne in mind that the colour must not be sufficiently pronounced to entirely arrest actinic action. In any case the exposure will be extremely prolonged.

Last on our list we have the use of coloured glass, varnish, or paper for the purpose of modifying the printing qualities of negatives. Here we are of opinion that the action is entirely due to the stoppage of light merely, and is independent entirely of the colour of the screen; though in a communication made to the Belgian Photographic Association a year or two since the author endeavoured to prove that the employment of such coloured screens affected the tone of the print, and that each colour produced its own particular tone. This fact we are perfectly willing to accept, but we do not follow the author in attributing it to chromatic influence. We know that with a given negative and with the same formulæ for salting, sensitising, and toning there is a tendency to produce prints of a uniform and distinctive tone irrespective of the depth to which the printing is carried; and we think that under similar circumstances the interposition of screens of various colours would result in the production of tones corresponding in variety, as each different colour would modify the character of the negative to a degree corresponding with its power of transmitting actinism. We can best explain the action of the coloured media in producing this effect by supposing the various grades of tint in the negative to be represented by the numbers 2, 3, 4, 6, 8, 10, &c., and the deepest shadows by 0. If a screen be interposed whose value in the same terms is equivalent to 1, the printing value of the negative will be altered to 1, 3, 4, 5, 7, 9, 11, &c., in which the shadows are represented by 1, and the relation of the various gradations entirely changed. And so, by varying the colour of the screen, the extent to which the original negative is modified increases in proportion to the power of arresting the light exercised by the medium interposed.

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PHOTO-MEZZOTINT ENGRAVING.

In the production of an engraved copperplate for yielding impressions in the copperplate printing press three or four methods have long been employed, each of these being especially applicable to certain classes of work. But since the discovery of photography, and the application of that art-science to the art of the copperplate engraver, numerous ramifications have been initiated, the result being that it is now possible to produce an engraved plate by a far greater variety of photo-chemical means and processes than at a former period could have been imagined by the most sanguine idealist.

As the process of which we are about to describe partakes of the nature of mezzotint engraving, we preface such description by some observations on this method. When a copperplate has its surface smoothly polished, it is obvious that when inked and subsequently rubbed with a clean pad of cloth the ink will all be removed. On the other hand, if the surface be made granular it is equally obvious that the ink cannot be removed from the surface by friction, and that on the application of sufficient pressure the ink will be transferred to a sheet of paper rolled in contact with the surface. These two facts form the basis upon which the system of mezzotint engraving is constructed. If upon a finely-granulated surface of metal—and it matters little whether the metal be copper, brass, zinc, or iron—certain portions be made shallower by scraping, or perfectly smooth by scraping followed by burnishing, the lights and shadows in the impression obtained therefrom will be in the precise ratio of the work put upon the surface, a touch of the burnisher upon the surface corresponding with a touch of illumination upon the otherwise dark impression obtained from it. Suppose, then, that an engraving of a portrait were required by the ordinary mezzotint process: it is only necessary that upon a well-roughened surface a drawing of the subject be made and all the middle tints slightly scraped, and the high lights more thoroughly scraped and burnished, to produce a plate in which, as directed by the tool of the artist, certain parts will print black, others white, and others again in a corresponding degree between these extremes.

Acknowledging here by a passing word all that has been done by Mr. Woodbury in connection with the preparation of engraved plates, we shall now indicate a method quite different from that of Mr. Woodbury, and by which we have succeeded in obtaining good results.

Upon a polished steel plate spread a thin coating of—

Saturated solution of bichromate of ammonia	5 drachms.
Honey	3 ,,
Albumen	3 ,,
Water	1½ pint.

Let this be dried by gentle heat, and then, when thoroughly dry, exposed to light under a transparency. Now remove the plate to a place in which the air is moist. We at one time considered that a cellar was necessary for this purpose; but, after repeated trials, we find that the atmosphere in an ordinary room contains moisture sufficient to act upon the surface of the picture which has been printed in the manner indicated. The preparation of which the formula is given above is slightly deliquescent, and very soon after it has become quite dry by the application of heat it attracts so much moisture from the atmosphere as to become more or less tacky. But the exposure to light has the tendency of hardening the film, so that the tackiness produced is in the inverse ratio of the luminous action. A large camel's-hair brush is now charged with a mixture of the two finest kinds of emery powder, and applied with a circular kind of whisking motion all over the surface. As those portions of the plate on which the light did not act are the first to become tacky the emery powder will first adhere to them, and we find that the coarsest particles attach themselves to those parts of the picture that are in deepest shadow. The exposure to light ought to be such that every portion of the surface, with the exception of the extreme high lights, becomes in a condition to "take" the powder. If the image be slow in becoming developed under this pulverulent treatment, then the moisture in the atmosphere should be slightly increased. The mere allowing of the picture to stand for five minutes longer frequently answers every purpose; the moistening of the air by artifical means will answer the same purpose without any delay. This film is so susceptible to the influence of moisture that the operator should take great care lest his damp breath impinge on the picture, as the moisture caused by such a local application might result in a local predominance of the powder which attaches itself in obedience to hygrometric law.

We may here observe that a quarter-of-an-hour's experimenting will at this stage enable the practitioner to learn more—provided he use his eyes and his judgment—than we could teach him by writing at far greater length than would here be expedient.

Assuming, then, that the picture has been developed, a polished plate of metal, softer than that upon which the picture is formed, must have been procured and laid down upon the other, face to face. They are passed between a pair of rollers screwed so well together as to ensure the setting off on to, or indentation of the emery-powder image into, the polished plate of metal. This latter plate is now precisely similar to the one produced by the mezzotint engraver.

An impression having been obtained by an ordinary copperplate process, the manipulator (whom we must now designate the "artist," seeing that art feeling and knowledge must be brought into play), having the proof and the plate both before him, applies a small burnisher with a curved point to the various portions of the picture requiring lightening. After having completed this work to the best of his judgment a second proof is obtained, and, if necessary, a second series of alterations are made upon the plate, until it is finally found that it yields an impression quite equal to the requirements of the subject. This being the case, it only remains to hand the plate over to the printer, who will produce impressions equal in every respect to the first proof.

The method we have here pointed out is no shadowy or mere theoretical one, for we have most carefully carried it out in practice; and but for the inconvenience of issuing a copperplate engraving with a journal printed in "letterpress" we might have illustrated this article by a specimen picture prepared by the process described.

OUTDOOR GROUPS.

We have, at one time or another, seen so many photographs of groups taken with no screen save the "free and open canopy of heaven," and which needed but little alteration to become excellent pictures, that we think a few jottings on the subject, ere the season for outdoor work commences, may prove of service.

A professional photographer summoned to photograph a group of two or three friends, a set of cricketers, foot-ball club, &c., &c., or an amateur of known photographic proclivities, with apparatus erected in the midst of (say) a picnic group or a wedding party, has one of the most difficult tasks set before him that it is possible to conceive. It is not alone the uncertainty of the weather, the condition of his chemicals, the scope of his lenses, or distrust of his power of posing a number of people so as to form a satisfactory picture; but there is, when once he has experienced the difficulties which surround the task, the knowledge that his whole day's labour may depend upon a single individual—generally "that first-rate fellow," the "soul of the party." There seems to be a curious psychological condition developed when a number of people come together for the purpose of being photographed. Men who at other times are considered to be in full possession of all their faculties seem on such occasions to be seized with an insane desire to be funny; the baldest wit and the veriest intellectual shoddy pass muster for brilliant humour and polished epigram, and at once loud guffaws from the men-kind and perpetual sniggling and giggling among the women-kind become the order of the day.

We have seen negative after negative ruined by one of these pseudo witticisms being uttered just before uncapping, no amount of entreaty appearing able to overcome the mental state of which we speak. Again: we have seen a man burst out in loud laughter, "just to see how we all looked laughing, you know;" and of the number of sitters whose lineaments are rendered indistinguishable through this sniggering our professional friends have given us a woeful tale.

The only way to succeed in a case like this is to be very firm, and to inform the whole party that no more negatives can be taken if anyone attempts to speak after the signal is given, which should usually be done a minute or two before uncovering the lens. Minor embarrassments constantly arise, and the tact required to preserve equanimity of tempers need not be dwelt upon.

Before the group has been posed ready for taking some consideration will have arisen as to the lighting, arranging, choice of ground, &c. Direct sunlight should, as a rule, be avoided. Under ordinary conditions it is safest to let the members of the group face the open sky, a situation being selected where the sun is screened by some obstacle which forms a background. If there be a tall building or clump of trees to one side to produce a little shadow the results would be so much the better. If rising ground can be found with suitable background, the elements of a very satisfactory picture exist. One of the best groups we ever saw was a number of girls—fifty or sixty—grouped standing and sitting on the bank behind a sunk fence, with a handsome building in the background. Schools, collections of workpeople, &c., &c., when on flat ground in large numbers may be grouped in three broken lines—standing at the back, sitting in the middle, and in the front row dispersed along the ground, taking care that among the latter there is no one's feet so disposed as to hide almost the whole of the figure behind them—a mode of arranging themselves to which gentlemen sitters are rather prone.

If the group can be broken up into smaller groups, each forming a complete little coterie of itself detached from, yet forming a part of, the whole, the results are more satisfactory. Above all things, it is desirable that no straight lines formed by rows of dress, accoutrements, &c., be permitted. If the photographing be performed in the neighbourhood of a house, chairs, mats, rugs, &c., must be ruthlessly requisitioned to render aid in introducing arrangements for breaking up the inartistic uniformity obtained by the unbroken line of figures which seems almost inevitable on such occasions; and, indeed, every occasion must be seized which favours the introduction of variety of pose and disposition of the figures. A rustic seat, a garden roller, &c., &c., even a wheelbarrow or a ladder, can be utilised as seats or lounges with advantage. We should strongly recommend that in the most frequent case of grouping, with some portion of the exterior of a large mansion as a background, the back of the premises be surveyed as to their suitability as well as the front, as it frequently happens that far more suitable spots for the purpose can be found there.

Bearing in mind optical requirements, it must be remembered in all these grouping arrangements that the figures should be disposed so as not to follow a straight line, but along a curve having the concave side facing the camera. The best of group lenses, when worked with full aperture, will give sharp results when so used; while if a portrait lens be made use of it will be difficult, without stopping it down to an impracticable degree, to get satisfactory results otherwise, unless used for a size of plate considerably smaller than it is made to cover. It is most probable that in the majority of cases portrait lenses will be used for the purpose, and, if some regard to their optical capabilities be shown, excellent results may be obtained. If used with full, or nearly full, aperture it is imperative that the figures follow in a not too mathematical manner—a very deep curve; in fact, as they approach the margin of the plate they require to be so much nearer the lens as to be perceptibly larger than the more central figures. To arrange them along a semicircle whose centre is the lens will not suffice; the curve must be much deeper and flatter at the sides, though it is scarcely necessary to say that with smaller stops these conditions need be less rigidly observed.

With regard to the use of the portrait lens for groups one very important point must be borne in mind—*no light from the sky or clouds should be allowed to enter the lens.* If the building or other object used as a background be not sufficiently large to screen the sky some opaque object ought to be placed so as to intercept the light —a "sunshade" by preference. If the lens have not that useful appendage, a piece of wood, a book, or anything opaque may be used; but the sky must be hidden from the lens, or the negative will be apt to be flat and foggy-looking, owing to flare. From this it will be gathered that many portrait lenses are unfit for taking any picture including sky, and such is the case—they are practically useless for the purpose; and we dare say that some of our readers will have brought home to them for the first time the reason of many of their negatives being foggy and flat. There is such a temptation to use a quick portrait lens for groups—and, under the conditions named, which, perhaps, are the most frequently found, its results are equal to those obtained by any other lens—that on the comparatively few occasions when foggy negatives have been produced through flare from sky or clouds the reason has been put down to some other cause. The bath, mayhap, has had the credit or discredit of it, and, as it worked properly when tried again under more favourable conditions, another example is supposed to have been found of the fickleness of the silver bath.

We need say very little about chemical conditions. The bath and collodion that work well in the studio will do the same when used for outdoor groups; but as the plate is so frequently kept waiting it will be desirable to back it well up with wet blotting-paper. It will also be found a great advantage to have a camera with two or three dark slides, that exposures in rapid succession may be taken, as it will generally be found that when the operator returns from his tent with another plate to expose he has all the work of grouping to go through again.

It has afforded us much gratification to be permitted to examine the facial lineaments of some of the gentler sex of Japan through the medium of *cartes de visite* taken by native artists. These have been enclosed with a communication from Mr. S. Cocking, which will be found in another page. Several of these young ladies have a pleasing expression coupled with an evident feeling of freedom from constraint. The artistic surroundings of the portraits are, however, totally different from anything that the most enterprising artist would venture to adopt in this country. If the reader imagine a fan with such ornate surroundings as fern leaves and flowers supply, the portrait being printed upon the fan, of which it occupies more than one-half, the remainder of the space being occupied by stripes and scroll-work, he will have no incorrect idea of one of the most attractive of these specimens. In another *carte* we have a basket with a scroll forming its background, this basket being well filled with flowers *and* an oval tablet upon which is imprinted the head and bust of one of the dusky daughters of Japan. Apart from the fact undoubtedly proved by these pictures that at least *some* artists in Japan "go in" very strongly for such floral adornments in their *cartes* as to render the portrait itself somewhat of an accessory, the pictures are excellent, although a more sparing use of a dominant front light would be much more in accordance with the usages of European artists. In the posing of the figures themselves much grace and good taste are displayed.

ON PLATINOTYPE.

[A communication to the Edinburgh Photographic Society.]

I have the honour this evening of drawing the attention of this Society to a very beautiful process of printing from photographic negatives, termed "platinotype." The author of this process, Mr. Willis, was present at your last meeting, and it would have been highly satisfactory if circumstances had favoured his bringing this subject before you himself. As it is I shall endeavour to describe briefly the chemical principles on which this process is based, and then give you a practical demonstration of the *modus operandi*, so far as is possible.

This process, I need scarcely tell you, has been repeatedly and very lucidly described in our photographic journals as well as in other periodicals, and particularly so by Mr. J. Traill Taylor, in the *Popular Science Review*. But it seems to me that it has not received that amount of attention which it deserves from the large body of photographers. The great simplicity of the few operations requisite, and the absence of that capricious character which attends several other processes, apart from the undoubted and absolute permanency of the results obtained, ought to gain the attention of a large majority of the brethren in our art.

Without presuming to make a comparison between results obtained by other methods and those by this process, I may be allowed to say a few words.

In the ordinary application of this process to the printing from negatives of all sizes, and in which it is not intended to subject the prints obtained to painting or other art finishing, I am aware that it has generally been asserted by the profession—and this with some reason—that the colour of the prints which they had seen was too cold to satisfy the general taste. Now, from the small amount of experience which I have had in this process, and from what I have seen produced by others having more experience, I feel confident in saying that there is little fear of getting a wide range in tone quite sufficient to satisfy in this respect.

In our much-loved process, with silver in its several conditions forming the picture, we have found it too facile in every respect—so much so, I fear, that, at the very best, pictures formed of silver in the metallic form or in other combinations cannot fail to be very prone both to internal as well as external influence.

In the case of pictures formed of platinum, if we succeed in obtaining the beauty of the silver picture (and this I think quite possible) we have a basis for our productions quite beyond those influences in the highest degree. Again: there is a very important branch of the art which for years past has been of much consequence to the professional photographer. I allude to the artistic finishing in oil and water-colours, &c. Now, I hardly think I need remark that the application of pigment in any form has been found, from various causes, to do other than hasten the destruction of the photographic image which formed the guide of operation.

Now in a picture formed of platinum we have a deposit of the pure metal in the form of what is generally termed "platinum black" forming the image in direct contact with a surface and without being enclosed in any film, and, consequently, fit to be loaded to any amount with colour without danger of peeling off or chemical change. This has always seemed to be a desideratum connected with the class of work referred to, and this process offers every facility to fill the void.

I shall now endeavour to give you a short description of the *rationale* of this process. Mr. Willis, in a series of experiments to find the best reducing agent of platinum, and, without any special photographic aim, found that oxalate of iron—a yellow and, in most menstrua, an insoluble powder—was soluble in a warm solution of oxalate of potash, and that it in this condition acted most energetically as a reducing agent on soluble salts of platinum. Mr. J. Traill Taylor, in his article referred to, gives such a clear and short description of the chemical change involved in this process that I cannot do better than quote a few of his remarks with the least possible modification.

Mr. Willis, therefore, having discovered that, as a solution of ferrous oxalate in potassic oxalate was so perfect a reducing agent of platinum, conceived the idea that, as ferrous oxalate can be produced by the action of light on ferric oxalate, it ought to follow that if paper or other media, which has received a wash of chloride of platinum, and ferric oxalate be exposed under a negative and then be subjected to a bath of oxalate of potash, the platinum will undergo reduction in proportion to the action of the light. In the practical application of this process pictures of fine quality are obtained in about one-fifth the time of exposure requisite in ordinary silver printing. When the pictures are taken from the printing-frame they are feebly, yet distinctly, visible, although up to this stage the platinum has not taken any part in the performance. The visible picture is wholly composed of ferrous oxalate, and it would have been equally visible had no platinum been present. The picture is now drawn over a warm solution of oxalate of potash, and instantly the image formed of metallic platinum becomes strong and rich, and of a warm, black tone. As far as mere permanence is concerned the picture may now be considered finished. The developing action of the oxalate of potash will be readily understood from the following considerations:—Bearing in mind the axiom that no chemical action can take place unless one of the substances be in solution, observe that when the picture is removed from the printing-frame the two substances are solid and, so to speak, apart—ferrous oxalate and the platinum salt; and hence the former body has not had an opportunity of acting upon the latter. Both are side by side, and in the most favourable condition for one to act upon the other, but each is held in check. The question now arises—What will relieve it so that it may reduce the platinum so conveniently placed for this purpose? This ferrous oxalate produced by the action of light is not soluble in water, but it is so in a solution of oxalate of potash. No sooner, therefore, is the picture brought into contact with a solution of this salt than the exposed parts, consisting of ferrous oxalate, are dissolved and immediately exert their reducing action on the neighbouring particles of platinum, which thus are made to form the picture. It must be remembered, however, that the paper or surface was charged with ferric oxalate in order to secure sensitiveness to light, and that it is desirable that this be removed. To effect this it is only requisite to subject the print for a few minutes to a weak solution of oxalic acid. This renders the whites very pure. There is a great charm about these pictures so produced on plain paper, the tones resembling those of a warm engraving. Added to their beauty and the rapidity of production they resist all the usual destructive tests.

By a very simple experiment I think I can illustrate to you the whole chemical action involved in the process now detailed. We have here the yellow powder, ferrous oxalate—the same which by the action of light is formed from the ferric oxalate, and which forms the visible picture. Now if I, by the aid of a little heat, dissolve this in potassic oxalate and bring it in contact with a solution of platinum, you will observe instantly a deposition of this metal in a dense black, finely-divided form. This is precisely what occurs on the exposed sheet when it is passed over the platinum oxalate bath; only that the deeper shadows and gradations of the negative under the action of the light affect, more or less, the amount of reduction.

I am not aware that this process has been demonstrated before any of the photographic societies in Britain hitherto. I believe that Professor Stebbing brought it before the Photographic Society of France in Paris, and demonstrated it successfully some time ago. I purpose now, therefore, to occupy a few minutes in doing the same before you.

For this process any kind of surface may be employed provided it be somewhat porous, and it is better that it should have received a coating of organic matter in the form of gelatine or, preferably, arrowroot. In the commercial prosecution of this process ordinary photographic or other good quality of paper is treated with arrowroot. This is now placed for a moment on a weak solution of nitrate of silver (six grains to the ounce) and dried; in this form the paper may be kept for an indefinite time. When it is required to produce copies it is only necessary to take a solution of the chloro-platinite of potassium and a solution of ferric oxalate, mixed, and coat the sheet therewith; then dry and expose under the negative. The picture on development may, as I have said before, be considered beyond the reach of change; but the colour of it is rather too black to please, and, therefore, it is desirable to modify it, and this is readily done by subjecting it to a solution of gold for a short time. After the desired colour is obtained it should be put into a weak solution of hyposulphite of soda or sol. chlor. soda for a few minutes, and from that to water; and, finally, in order to remove all traces of the ferric oxalate, the print should be placed in a weak solution of oxalic acid for as short a time as may be considered necessary, and then with a slight amount of washing the picture may be hung up to dry.

If it be desired to give a finished look or glossy surface to the prints, this can be done by various methods, and, as is generally the case, the depth of shade and gradation is made more attractive.

I shall now proceed to illustrate the operation. I have brought with me a few sheets exposed today before I left St. Andrew's, and these I shall develope. After I have prepared a sheet I shall hand for your inspection the sheets exposed this morning, and you will observe that there are two of them equally visible with the others; but you will observe those marked as having been prepared without platinum—only with the ferric salt. On exposure to the potassic oxalate bath these will disappear entirely owing to the solution of the ferrous oxalate, no reduction being possible.

I presume you are aware that Mr. Willis has secured a patent for this process in this country, and that he has entered into arrangements and is associated with, in this matter, the Albion Albumenising Company, of Glasgow and London, which company have the right of dispensing licenses. I learn that very recently the process has also been patented in France, and that a firm there have absorbed the right for that country.

The specimens of prints which I now submit to you are from several sources, and a number of them have been by myself subjected to extreme tests in order to prove the indestructibility of the image. There is one marked as having been for twelve hours under the influence of sulphuretted hydrogen, and the half of the same picture was immersed for an additional twelve hours in the acid solution employed to form the gas. Others have been for six weeks on a floor constantly wet and subjected to treatment only short of being trodden upon, and you will observe that there is no change whatever.

Mr. Willis has nearly completed his researches in the matter of producing an emulsion with the view of still more simplifying the process; and when he returns from his journey to the west we may expect to hear from himself on this subject. Trusting that I may not have wearied you in the foregoing remarks, and that a spirit of inquiry may be aroused on the subject, I now conclude with my thanks to you for your patience and kind attention. T. Rodger.

NOTES FROM JAPAN.

Yourselves and readers will be surprised, perhaps, to hear of this country entering the lists as one of the centres of photographic industry, but yet such is the fact; and, thinking it may interest you to know how things are progressing in this far east, I pen these few lines.

Photography was first introduced here about fifteen years since, when an old Japanese friend of the writer's learnt the art as it then existed, and practised the collodion process. He has often told me of the difficulty he has had to encounter to get his country people to submit themselves to the ordeal of the black art. When he first started in business, instead of receiving payment from his sitters he was obliged to reverse the operation and pay them to come, and has given as much as twelve shillings to a good-looking Japanese lady to have her portrait taken. But even this upside-down state of affairs answered his purpose very well in a commercial sense, as he used to sell copies of such to foreigners at three dollars each. At this time the Japanese held the belief that to have one's photograph taken meant certain death within two or three years afterwards, as they said the soul left the body with the image that was impressed of them upon the negatives; in fact, to such an extent was this belief held that my aforesaid friend related to me how, on one occasion, a would-be suicide one day paid his studio a visit and said he was tired of this world, and requested his portrait to be taken, that he might thus be enabled to die an easy death, and at the same time leave his soul in the safe keeping of his relations in the shape of his photograph. This individual was the only sitter my friend had, for many months after he started in business, who ever paid him to have a photograph taken. You must not think, however, that the Japanese are such a superstitious race as my readers might, perhaps, imagine from the above; but you can very well understand that at that time—so shortly, too, after they had only made the acquaintance of foreigners at all—it is not surprising that such a mysterious art as it appeared to them and, I may say, I think even to many of us at that time, should have attached to it something supernatural.

How different now, however, is the state of affairs! The Japanese have as fully altered their idea with respect to our black art as they have in most other matters, as you have, no doubt, already heard; and today, in Japan, photography is one of the regular industries of the country, and finds employment for, I may say, thousands of its people. It has enabled the writer to enter very largely into the importation of all photographic requisites. I have now on the books of my Yedo place of business no fewer than 180 photographers as customers, while there are altogether about 240 photographers in the capital alone, beside an immense number in nearly every town throughout the interior; and I need hardly say that now the Japanese photographer is, like his brother in Europe, paid by his sitters, and has not any longer to pay them.

Of course, dear reader, you must not look in this communication for interesting processes or new wrinkles. The time has not yet come for the Japanese to teach his western brother; in fact, I may say we are here, so far as the natives are concerned, a long way behind. All they know is the wet collodion process, and most of them have not yet heard of such a thing as a dry process, much less your bromide emulsions and gelatine pellicles; but what they do is very well done, and I have the pleasure of sending you a few samples of cards taken by one of our friends. These represent his ordinary work, as they were simply picked out by the writer from his album in his show-room. As samples of photography the Editors, and other friends who may happen to examine them, must not judge too severely these efforts of Japanese photographic artists; but if you cannot admire their technical qualities there may be something in the artistic "get up" of them that may interest you. Perhaps you may even gain some advantage by an inspection of them, although they are only the work of a heathen "Japanee." My friend who produced them was very diffident about letting me send them to you, as he says he knows the work of foreigners is so much superior; but he is ambitious, and while fully appreciating his own inferiority, at last acceded to my wish to send them to you, in the hope that some of your generous readers will do him a kindness and forward him some of their best work in return, so that he may remedy his faults by an inspection of the examples he receives.

Unfortunately the rich stores of knowledge contained in the photographic literature of the day are a sealed book to the Japanese, and many a willing listener I have had of a cool summer's evening as I have translated to them some of the articles from The British Journal of Photography. They were so interested that they have decided to become subscribers, and to employ an interpreter to translate it for them. This shows their anxiety for something better, and, no doubt, in the course of a few years you may be startled with some novel discovery even from Japan.

Our arts and sciences are great civilisers, and photography, in particular, has been in this country a greater missionary than any Williams or Livingstone; and it must be a gratifying fact to the many ministers of the Gospel who grace your pages with the result of their photographic pastimes to know that in so doing they are far from neglecting their higher and more useful calling by assisting the advancement of our art. My friend to whom I alluded at the commencement of this communication, through the insight he has had of our art, has been led on to further researches in our literature and mode of thought, and is now as good a christian as any of us; so also is all his family. Many a time have I met the old veteran—the father of photography in Japan—going to church, leading his little daughter by the hand.

You see, dear reader, the influence that is exerted by what is written in the journals, and this leads me to change my topics and ask if it be not possible to introduce a little more Christian spirit into the journals than what, I am sorry to say, I often notice. I am led to make these remarks as, being at a long distance and a stranger to all, I am placed in a thoroughly independent and impartial position. As a reader of pure photographic topics I am sorry to notice how often photography is mixed up with party feeling, jealousy, and wranglings; sometimes disputes as to who was the first to discover a certain novelty, while in these discussions there is nothing to interest anyone except the disputants themselves. I noticed at the beginning of the year you turned over a new leaf, and stated you would eradicate the evil; but it seems to have crept in again. I can assure you your foreign readers will be very glad indeed to see less of angry letters and more of earnest work for the advancement of our science.

With respect to photographic societies you will shortly have to chronicle the existence of one here—in fact, for some months past the Japanese have started one among themselves at the writer's suggestion; and, although as yet working quietly and privately, we hope to see it in full bloom shortly. Beside the many professionals among the Japanese we have many who have taken up the art as an amusement; and among one of the most energetic amateurs is the late Tycoon, who, since his deposition during the revolution of 1868, has retired into private life. I hope at a future time to give your readers something more interesting than my present communication contains; but, in the meantime, perhaps it will interest your many readers to learn that the art is making progress even in far-off Japan.

By-the-bye, Mr. M. Carey Lea's collo-developer has been introduced here; it is in general use at present, and gives great satisfaction. The writer has made the collocine, obtaining a product exactly as described by Mr. Brooks and others, and fulfilling every expectation.

Yokohama, February 27, 1877. S. Cocking.

ON A NEGLECTED METHOD OF INTENSIFICATION.

[A communication to the Photographic Society of Great Britain.]

Some three or four months ago I had the pleasure of a visit at Chatham from Mr. Warnerke, and in the course of some experiments with his tissue he introduced to my notice a method of giving intensity to the negative which, as far as I know, has not been practised to any great extent in this country, but which to my mind is superior to any that I have as yet tried, including the ferrocyanide of lead intensifier. The method of procedure is as follows:—To a saturated solution of copper sulphate is added a sufficiency of potassium bromide; and when I say "sufficiency," I mean a quantity which is capable of converting nearly all the copper sulphate into potassium bromide. At ordinary temperatures an ounce of water will dissolve 120 grains of copper sulphate.* It will, therefore, be necessary to add about 125 grains of potassium bromide (dissolved in a small quantity of water) to effect total decomposition. The *exact* quantity is immaterial, but the dose of bromide should not be spared. Personally I prefer to use at once a solution of copper bromide, by decomposing barium bromide with copper sulphate, or by acting on copper oxide with hydrobromic acid. In this case a solution of 100 grains of the salt to each ounce is of sufficient strength.

Having secured a solution of copper bromide in one of these ways the developed and fixed plate is flooded with it, and allowed to act till the grey metallic silver becomes of a white appearance. When this is obtained the plate is washed under the tap till the green colour of the solution no longer tinges the water, and until the addition of ammonia causes no distinct blue colour in the wash water. After arriving at this point, two methods of proceeding are open:—The plate may be treated with alkaline pyrogallate, when there will be an evident gain in intensity. So far as this the method of intensification is similar to that described in The British Journal of Photography, in which copper chloride is employed instead of the bromide. Instead of giving intensity by the alkaline pyrogallate, another method is open. This consists in flooding the bleached plate with a strong solution (say of 100 grains to the ounce) of silver nitrate. An intense black results; so deep is it, that in general it is more suitable for the intensification of line-engraving negatives than for half-tone negatives. With an emulsion giving a thin negative, however, it is invaluable.

When I saw the action of this intensifier I was puzzled as to the reaction that took place; and, finding it absolutely impossible to get a satisfactory analysis from the deposit on a plate, I precipitated silver and treated it in the same manner, and analysed the compound at each stage of the proceeding. The results obtained are remarkable and well worthy of attention. On addition of the copper bromide the following reaction was observed:—

1 equivalent of silver + 1 equivalent of copper bromide gives 1 equivalent of silver bromide + 1 equivalent of sub-bromide of copper. Or—

$$Ag + CuBr_2 = AgBr + CuBr.$$

On exposure to the light the compound darkened readily, giving secondary evidence the silver was in this state. In one or two analyses I thought I had found that the one equivalent of bromine from the copper bromide had combined with two equivalents of metallic silver; but, eventually, I found that invariably when the reaction was complete the whole of the metallic silver was converted into bromide. When the above compound is treated with silver nitrate we have a remarkable reaction. The sub-bromide of copper combines with the silver nitrate and forms silver sub-bromide, thus:—

$$AgBr + CuBr + 2\,AgNo_3 = AgBr + Ag_2Br + Cu(No_3)_2.$$

The question as to whether sub-bromide of silver was really formed, or whether it was not merely bromide with one atom of deposited silver, was at first difficult to answer; but I think I have satisfactorily proved the presence of the sub-bromide. Had there been metallic silver present it would have been possible to pass a spark from a Ruhmkorff coil through the compound; the small atoms of silver would have acted as steps by which it could pass. This was proved to be impossible, and, moreover, the current from a strong battery would not pass through the compound even when heavily compressed. I may state that in a mere mixture of bromide and metallic silver the spark passed.

When treated with ammonia the compound split up into AgBr and metallic Ag. Nitric acid was also able to decompose the Ag_2Br, as was potassium cyanide. It need scarcely be said that no mixture of silver bromide and metallic silver would give the jet black appearance I have indicated, though a mixture of blue colour of the sub-bromide and the yellow of the bromide would do so. It was also noticeable that after treating the supposed Ag_2Br with ammonia the metallic silver separated out in spangles, much larger than the original particles of metallic silver. In the case of a single mixture of the bromide and metallic silver, I do not think this phenomenon would be observed.

When the intensity is caused by the application of alkaline pyrogallate we must look for a different reaction. Though you have the sub-bromide of copper present it is soluble in ammonia and can all be washed away, and probably is, if the washing be effectively done. In this case the intensity is gained by a rearrangement of the atoms of silver, for there is only the same amount of silver present to be reduced as there was originally on the negative. In this case, then, we have a gain in intensity caused by a physical process more than by a chemical. Where long washing of the white compound is resorted to I am not prepared to deny that part of the image may be formed of metallic copper. Another point to which I wish to call your attention is this:—CuBr is said to be insoluble in water, yet you may go on washing the bleached precipitate for days, and still you will find *traces* of copper bromide in the wash water. After some trouble I have found that the sub-bromide is rather unstable, tending to pass into the bromide and metallic copper, thus:—

$$2\,CuBr = CuBr_2 + Cu.$$

Eventually, of course, the metallic copper is converted into oxide.

In preparing plates on which to secure photographs in colour the same method has been adopted, substituting the chloride for the bromide, and the following are the phenomena observed:—The copper chloride bleaches the metallic silver on the plate, and gradually the bleaching gives place to a ruddy tint, and this probably is due to the reaction indicated above. As this is part of the same method, already indicated, of obtaining intensity, it would follow that the image may be partly metallic copper, even before treatment with alkaline pyrogallate.

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* It must be remembered that copper sulphate is combined with five equivalents of water.

To Mr. Warnerke belongs all the credit for bringing this method of intensification to the knowledge of the Society; for, had he kept his treasure to himself, as is too often the case with some who get hold of "a good thing," I should not have had the satisfaction of referring to it tonight. Mr. Warnerke informs me that he found the treasure in the *Photographic News* amongst some American correspondence. I advise everyone to give it a fair trial. At Chatham we infinitely prefer any process of intensification which gives the desired opacity without the necessity of converting the silver and other metal into sulphides. My experience has shown that all such are unstable to a greater or less degree.

W. De W. Abney, R.E., F.R.S.

DEFECTS IN CARBON PRINTING AND THEIR REMEDIES.*

In continuation of the defects known as "reticulation of the film," Dr. Liesegang resumes:—

The tissue must be allowed to remain longer in cold water before being attached to the glass. This defect does not happen when the image is developed on stearine paper. The tissue must be kept in cold water for about fifteen minutes if it adhere too strongly at the margin.

Small, brilliant patches of air-bubbles appear in the proof.——Same remedy as that in the last paragraph. In order to ascertain the cause of this, it is requisite to try the following experiment:—Plunge two small pieces of carbon tissue into cold water; take one piece out in ten seconds, place it on glass and apply a squeegee, and leave the other piece of carbon tissue in the water for about five minutes before placing it on the glass; it will then be seen that the first piece of tissue contains air-bubbles, whilst in the second piece there are none.

Fog, especially at the foot of the proof.——If this fog be not removed by the use of a hot-water bath it is because the collodion film has been insufficiently washed with cold water.

Faintness of the half-tints in the image.——The negative is too dense. Expose the sensitive tissue for some seconds to a diffused light before using; or the tissue has been dried too quickly, and it then becomes too sensitive. The bichromate is too weak or too old.

The tissue detaches itself from the glass when drying.——This is the result of drying too quickly.

The wax is bad.——Add a small quantity of resin.

Transfer paper being applied to the image it will not detach itself from the glass.——The glass has not been sufficiently waxed, or there is too great a quantity of resin in the wax. The greater part has been removed by the polishing of the glass.

The transfer paper detaches itself, leaving the proof on the glass.——The transfer paper has been put into water that has been of too high a temperature, or the gelatine layer is dissolved.

The proof, detached from the glass, is covered with brilliant patches, especially in the high lights and along the outline.——The water in which the transfer paper has been steeped has been either too hot or too cold; that is to say, the layer of gelatine has not been sufficiently softened or has been dissolved.

The proof has a perceptible grain.——The proof on glass has been soaked too long in cold water before the application of the transfer paper, or it has been plunged into hot water when cold water should have been used.

The half-tints of the proof disappear during transferring.——This happens when the operation is carried on without a collodion substratum.

Dr. Liesegang concludes this list of the defects in carbon printing and their remedies by stating that he does not pretend to have given a complete or exhaustive list. Such a complete list would undoubtedly be very useful, but he leaves the subject to be more comprehensively treated by others.

DRAWBACKS.

[A communication to the South London Photographic Society.]

Finding this evening we have no paper—in hunting phraseology we have drawn blank—I will try to supply the hiatus by a few memoranda that may, perhaps, give rise to some discussion. Of course, this paper is prepared under considerable drawbacks—the drawback of short time for consideration; the drawback of not having any books of reference; the drawback of having nobody else's writings to con over and appropriate under a new title; and, also, the drawback of having it printed with all errors that may creep into such a rapidly-prepared paper. With all these drawbacks I think I cannot do better than entitle this paper *Drawbacks*. If I make any very glaring errors I must ask you to overlook them.

The first little matter that occurs to my mind is that of a plan for curing the reticulation of the collodion film when it is produced by solvents containing too much water, and which plan has gone the rounds of the photographic literature of the day. It is as follows:—"Place in the collodion to be cured a few strips of dry gelatine; this will absorb the water, and the collodion will be rendered serviceable." Now, if this would absorb the water no doubt the plan would answer; but, as it will do no such thing, there is a considerable drawback to its general adoption. It was a simple matter, so I tried it. Several months passed by—no difference. At the end of twelve months, save and except the gelatine appeared rather more opalescent than before, no alteration had taken place. I added a fourth part of water to this collodion and gelatine and let it stand some months longer, and the result was that the gelatine had not absorbed any, or at least sufficient, water to make any appreciable difference to the bulk; but it had become a pasty mass at the bottom of the bottle. What changes had taken place I am unable to say, and merely record the fact.

The permanency of silver prints has always been a matter of serious consideration with photographers, and any plan that would tend to give increased permanency was, and is, hailed with delight. Some nine or ten years ago Mr. J. Spiller recommended the addition of ammonia carbonate to the hypo. fixing bath. I felt very chary at expressing my opinion on the matter, having had comparatively small experience, although I had made a practice of adding it previous to Mr. Spiller's recommendation, but with a different intention. The idea was that hypo. in solution was apt to be acid and detrimental to the prints; so I used carbonate of soda or ammonia, as the case might be, for the purpose of correcting this acidity. After hearing Mr. Spiller's paper I invariably used the ammonia, and with great advantage as regards permanency. Proofs then prepared have remained as bright and good as the day they were done. During the past eighteen months we have used little short of two hundredweight of ammonia carbonate, and, as far as the matter of permanency, with, I have no doubt, good effects. But here comes the drawback: it was found that when the proofs so fixed were washed and dried, on careful examination (I say "careful examination," as the fault was very difficult to detect) a peculiar bloom was found to cover the whole face of the print with marks and smears of a dull appearance here and there. Till these proofs were mounted the fault was not noticeable, but when they had been mounted these dull marks were very great eyesores, and necessitated each proof being rubbed over, the deposit, whatever it was, being removable by this means. Perhaps some gentleman present has had similar experience and can suggest a remedy; for the present I am quite unable to suggest a cure, and this drawback is such as will prevent an otherwise useful modification of the fixing bath to be used where a large quantity of work has to be got through.

I have seen cyanide of potassium recommended in dilute solution for cleaning negatives that have got soiled with silver stains from hard work—small particles of the silvered albumen adhering to the *cliché*, and making white specks. There is no doubt whatever that the remedy will be, and is, efficacious; but here is a drawback, unless the varnish of the negative be very hard: the cyanide is apt to dissolve it sufficiently to attack the negative beneath and utterly destroy it. Great care is, therefore, necessary to be taken in ascertaining the protective power of the varnish. Several applications of a rather strong solution are frequently sufficient to injure most negatives. This plan, however, used with extreme caution, is undoubtedly serviceable.

Of course there are many other drawbacks to processes that have been recommended for the benefit of photographers, but time is too short to permit allusion to them; therefore I will, with these few remarks, conclude, and leave them for discussion.

One little matter that scarcely comes under the head of "drawbacks" is the possibility of developing an ordinary wet plate by the alkaline method. In making a few experiments with the intention of causing a wet plate to keep moist and sensitive I gave an ordinary sensitised film a coating of albumen and glycerine in the proportion of one ounce each to half-a-pint of water. Mr. William Bedford suggested development with the alkaline method, which I carried out, and found, although the negative seemed rather poorer than I should have liked, it came out fairly satisfactory.

E. Dunmore.

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* Concluded from page 151.

FOREIGN NOTES AND NEWS.

Forthcoming Exhibition at Amsterdam.—*Die Laterna Magica.*—Herr Liebmann's Enlarging Process.—Blisters in Albumenised Paper Again!—Carbon *versus* Pigment.—Photograph or Photogram?

The Photographic Society of Amsterdam have announced an exhibition this autumn, to be opened on the 16th September, and to remain open till the end of October. Two gold, twenty-one silver, and forty-three bronze medals will be awarded. Intending competitors must give notice to the Secretary before the 15th July. Letters to be addressed—"Union des Photographes à Amsterdam à l'Adresse de la Société: Arti et Amicitiæ."

The first number of a new German quarterly serial, called the *Laterna Magica*, has just come to hand. It is edited by Dr. Liesegang, of Dusseldorf, and, as its name imports, it is, like its American contemporary, entirely devoted to the discussion of the best lanterns, lights, burners, &c., for projecting pictures, and the preparation of suitable slides. Amongst the writers of the articles we observe the names of the Rev. F. Hardwich, Dr. Morton, and W. Coddington.

In last month's number of the *Mittheilungen* Herr Liebmann's enlargements were very highly spoken of, and in the current number he gives an account of the method by which they are produced. It is as follows:—An enlarged transparency on collodion is taken with an ordinary camera, and fixed without intensification. This positive is printed upon carbon tissue until the twenty-second degree of a Vogel's photometer is reached, and is then developed upon glass. When the negative thus obtained is *dry*, it is intensified by being dipped for five minutes into a 1 to 500 solution of potassic permanganate, a negative so treated giving prints, without retouching, which are difficult to distinguish from prints from original negatives. Of course it is evident that the operator has it in his power to place the negative in the camera either with glass or varnished side in front, and get either a reversed or an ordinary positive.

With respect to the vexed question of blisters in albumenised paper, Herren Henvess and Weise, of Wernigrode, write to the *Mittheilungen* to the effect that they have experimented with paper from four different German manufactories, the result being that there was no great difference between the paper of the various manufacturers, but the blisters appeared only upon those albumenised papers that had a double-surface film, and they appeared oftener in new paper than in old.

Amongst the various remedies for blisters usually recommended they found only two which were a partial protection, thus:—1. To the pound of 1 to 8 fixing solution an addition of five grammes of liquid ammonia hydrate effectually prevents the formation of blisters; but (and it is a very large "but") the tone of pictures fixed with this appears to be injured, and the whites are not all that could be desired, this last fault increasing with time. 2. By using a fixing solution of 1 to 15 the formation of blisters is partially, but not effectually, prevented; and, whether reasonable or not, one has a certain mistrust of so weak a fixing bath.

As an absolutely certain means of preventing blisters which has a rather advantageous effect otherwise upon the pictures, they recommend a *spirit* bath, in which the pictures should be placed when they are removed from the gold bath, and in which they should be allowed to remain until they appear quite glazed, which they will do in two or three minutes. They are then to be drawn through water, after which they undergo the usual subsequent treatment. Herren Henvess and Weise say they have recommended the spirit bath to several of their friends, and that they have all found it useful. They add that with daily use such a bath should keep good for at least twelve or fourteen days, and that, as it can afterwards be used for burning, the actual cost of the bath is not great.

The editor of the *Mittheilungen* expresses a wish to see the term "carbon process" supplanted by pigment process, since pure carbon is seldom the only colouring matter in the tissue, and there are some, like the reddish, which contain nothing but red chalk, and others in which other colouring matters form a large percentage.

There is a movement going on having for its object the disuse of the word "photograph" in the sense of a picture produced by photography, and the introduction of the more correct word "photogramme," or "photogram," instead. In the wording of the official invitation to take part in the forthcoming exhibition at Amsterdam the newer term is used; but, though strictly speaking, it may be more correct than "photograph," the latter has been so long used in its present sense, and people are so accustomed to use it, that, in this country at least, it is to be expected photographs will afford another illustration of the saying that "possession is nine points of the law." In the parallel case of the word "telegraph," which was at first used to denote both the message and the instrument by which it was sent, the confusion was soon felt, and the change of the word from "telegraph" to "telegram" was made ere the former had become a household word. In the case under consideration there is not the same danger of confusion—at least in English—as we have no apparatus for taking pictures which we call a "photograph;" so that the change would be made entirely for philological reasons. To such reasons the general public would be apt to reply—"You should have thought of all that before; we have got into the habit of saying 'photograph,' and it would be so troublesome to learn to use the new word that you really cannot expect us to do it."

Meetings of Societies.

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SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The usual meeting of this Society was held on Thursday, the 5th instant,—the Rev. F. F. Statham, M.A., F.G.S., President, in the chair.

Mr. E. Dunmore read a paper on *Drawbacks* [see page 175], which, it was explained, had been written that evening in order to prevent the meeting being without a paper.

Mr. Warnerke had found that gelatine did not absorb the water from collodion. Reticulation was not always due to excess of water in the collodion, but to the nature of the pyroxyline.

Mr. Foxlee, referring to the cleaning of negatives, suggested the use of pure, strong cyanide of potassium.

Mr. Ayres always cleaned his negatives with a tuft of cotton charged with spirits of turpentine. He objected to a large quantity of carbonate of ammonia in the silver bath, as it dissolved the albumen from the paper and made the prints dull. In reply to a question he said that he fixed in a bath containing an ounce of hyposulphite of soda to a pint of water, allowing the prints to be immersed for fifteen minutes.

After some other remarks a vote of thanks was given to Mr. Dunmore.

Mr. Warnerke then brought before the meeting the process of intensifying negatives by means of bromide of copper and silver, as described in this Journal last week. He showed in operation the process of intensifying, and handed round among the members the specimens which he had intensified before them. He concluded by describing a plate-box and a camera-stand which had been constructed for him by Mr. Lane, both of which displayed features of novelty.

After a vote of thanks to Mr. Warnerke the proceedings terminated.

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EDINBURGH PHOTOGRAPHIC SOCIETY.

The sixth ordinary meeting of the session was held at 5, St. Andrew-square, on the evening of Wednesday, the 4th instant. The chair was occupied by the President, Mr. J. Lessels, and the number of members present was unusually large.

The minutes of the previous meeting were read and confirmed, and the following gentlemen were admitted ordinary members:—Messrs. Charles Philip, John Macmahon, Daniel Macfarlane, James Muir, James Dickson, and James Hay.

Mr. T. Rodger, of St. Andrew's, read an interesting paper on the *Platinotype Process* [see page 172], and illustrated it by a number of successful experiments, which conveyed a clear idea of the various reactions involved. Especially interesting were the experiments by which the simplicity of the process, the rapidity with which the paper can be prepared, and the great sensitiveness of the preparation were shown. Some idea of the latter may be gathered from the fact that two prints were obtained from negatives by an exposure of less than two minutes to the light given out by the combustion of a double strand of magnesium wire.

The President said that the Society was much indebted to Mr. Rodger for the clear description he had given of the interesting process, and especially for his highly-instructive experiments, which must have entailed so much trouble on him. From the lucid way in which the subject had been treated there could be no question either of the success or value of the process.

Mr. J. G. Tunny congratulated Mr. Rodger on the successful demonstration of what he considered the best process yet devised for many purposes, and especially for coloured work, the texture being just the very thing required in that branch of art. He had experimented a good deal with the process when it was first introduced, and had no doubt that prints in platinum black were quite as permanent as those in carbon. They were not affected by either nitric, sulphuric, or hydrochloric acids used singly, although, of course, they yielded readily to the nitro-hydrochloric; and he found, also, that a strong solution of hyposulphite of soda materially changed the colour of the deposit, and therefore supposed that something like a platinum hyposulphite might be formed.

Mr. W. T. Bashford had not previously given the process much consideration, and, therefore, until that evening knew very little about it. He thanked Mr. Rodger very much for his beautiful demonstration and lucid explanation, and was quite satisfied that from them he had learned enough to enable him to succeed on a first trial. The only difficulty that occurred to him was that of ascertaining exactly the proper exposure, as from the fact that the development was almost instantaneous, and the difficulty of in any way reducing a too dark image, he presumed that there could be but little latitude in the time of exposure.

Mr. J. M. Turnbull was very much pleased with the paper and experiments, and was quite sure that, from what he had just seen, he could at once do good work in platinotype. It was so simple and so satisfactory that in all probability carbon printing would soon be a thing of the past.

In reply to a question from Mr. Norman Macbeth, Mr. **Rodger** said that, from his experience of the process, he had no doubt that the actual cost of prints in platinotype was considerably less than that of prints in silver. In answer to Mr. Bashford, he (Mr. Rodger) said it was quite true that a platinum print could not easily be either toned down or darkened, and, in consequence, the exposure must be properly timed; but neither he nor his assistant found any difficulty in hitting the proper time when the actinometer was used.

A number of fine specimens were then handed round for inspection—some by Mr. Rodger himself, some by the Albion Albumenising Company, and some by Mr. Griggs, of Blackpool. All were very beautiful—the last-named especially so, as they were not only most charming subjects, but by a method of his own, just sufficiently glazed to give the generally-admired transparency not often seen in prints on plain paper.

There were also shown some prints on rough crayon paper by Mr. Willis, the inventor of the process, from paintings or water-colour drawings, regarding which

Mr. **Norman Macbeth** said he had never seen anything finer. They came nearer to the pure white and black of an engraving than copies by any other process, and would, he thought, compete very closely with the productions of MM. Goupil and Co., now so popular.

Mr. Hunter, of Hawick, also exhibited a number of very good *carte* portraits printed in platinotype, stating that he had only given the process one trial, and those were the results. It was certainly the simplest process that he had had anything to do with.

The Corresponding Secretary then read a letter from Mr. Kareline, of Nigny-Novgorod, which mainly referred to the criticisms that had been published on his works, especially the picture to which was awarded the gold medal at the late exhibition. Mr. Kareline wrote to the effect that all his pictures sent to the exhibition were printed from single negatives taken direct, and were untouched prints from untouched negatives. With trifling exceptions they were the portraits and groups taken in the ordinary course of business, with no more time devoted to them than that generally given where other sitters were waiting. Mr. Kareline has evidently solved the problem of how, by a small stop or otherwise in combination with a short exposure, to get objects that are in various planes in equally good focus; and for this secret he has been offered considerably over fifteen hundred pounds, but he wants nearly five thousand pounds, so that he may be able to devote himself more thoroughly to photography as an art.

Mr. Paton, of Greenock—who, along with the Secretary of the Glasgow Photographic Association, had come from Glasgow to attend the meeting—laid on the table a number of cabinet pictures in imitation of Kareline's style, and briefly explained the method of lighting employed. The principal light was admitted through an ordinary window in the wall of the studio, and the shadows softened by a secondary light coming from a considerable distance in front. Under ordinary circumstances the detail in the white curtains would be lost from the large amount of light coming through the window; but this was obviated by lining them with an opaque substance, the front light only being allowed to act on them.

Mr. **Tunny**, while admiring the pictures shown by Mr. Paton, and admitting that they bore a close resemblance to those of Mr. Kareline, still held to his original opinion that the window was not the source of light; that it was, in fact, a "property window," and that the principal light came from above it, and the secondary light from a long way in front, or from reflectors.

Dr. **Thompson** said they were greatly obliged to Mr. Paton for giving them an opportunity of seeing his pictures, and for the description of the conditions under which they were taken, as they had gone far to illustrate the method adopted by Mr. Kareline. He hoped that others would soon follow in the way led by Mr. Paton, and that they should soon have many able to produce work equal to that of the successful Russian.

A number of fine carbon enlargements, by Messrs. T. Annan and Co., of Glasgow, in both single and double transfer, were then brought to the notice of the members, and elicited much admiration, the *Broken Toe*, by Mr. Diston, of Leven, in various sizes being exceptionally good—much better, in fact, than a print from the original negative.

The Secretary next read a communication from the Glasgow Photographic Association with reference to a possible application for an extension of the patent granted to Mr. Swan, which expires next year, and requesting the co-operation of the Society in opposing such an application.

Mr. A. Robertson, the Secretary of the Glasgow Photographic Association, briefly explained the reasons which had induced them to send out the circular, and

Dr. **John Nicol** said that, while anxious to fraternise to the fullest extent with their Glasgow friends, he had a doubt as to the propriety of entertaining the question then brought before them. One of the fundamental principles of the Society had been the determination to steer clear of the commercial element; and he thought that any action in regard to patents would be an unwise departure from that principle.

It was ultimately agreed, on the motion of Mr. T. Pringle, seconded by Mr. M. G. Dobbie, to remit the matter to the Council and bring up a report on the subject.

In accordance with a provisional circular a number of pictures from foreign exhibitors that had been mounted and framed by the committee were disposed of to the highest bidder, and brought fair prices, upwards of fourteen pounds being realised.

Votes of thanks were then given to Messrs. Rodger, Robertson, and Paton, and the meeting was adjourned, several items on the billet being postponed in consequence of the lateness of the hour.

BRISTOL AND WEST OF ENGLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

The ordinary monthly meeting of this Society was held at the Museum, Queen's Road, Bristol, on Wednesday, the 4th inst.,—Dr. Thompson in the chair.

The minutes of the previous meeting were read and confirmed.

The **Secretary** read a communication, received from the Glasgow Photographic Association, asking for the co-operation of the Bristol Association in trying to prevent the renewal of the Swan carbon patent.

A general discussion ensued, when the following reply to the Glasgow Photographic Association was decided upon:—"Under the existing patent good and reliable tissue is manufactured. The non-renewal of this patent would chiefly affect professional photographers, and would not increase the scope for fresh discoveries proportionately with the sacrifice that would necessarily accrue to the present holders of the patent; for, without any discourtesy, it is generally admitted as incontrovertible that few, if any, discoveries of importance have emanated from the professional community—no doubt attributable to the want of time for research and other causes. Also, looking at the probable manufacture of inferior tissues, this Association is of opinion that the renewal of the present patent—all requisite conditions being fulfilled—should *not* be opposed."

Mr. T. Davey, of Bristol, was then elected an ordinary member of the Association.

Dr. Thompson's paper was postponed till the next meeting. The meeting was then adjourned.

Correspondence.

April Meeting of the Photographic Society of France.—Th 1,000 Francs Prize Awarded to M. Chardon.—On Pinholes.—A Fire at the Studio of M. Adam-Salomon.

The general monthly meeting of the Photographic Society of France took place on Friday evening last, the 6th inst.,—M. Peligot in the chair. After the election of new members and the reading of correspondence, the interest of the members was concentrated upon the report of the commission which had been chosen to award the prize of 1,000 francs for the best dry-plate process.

The *concours* was closed on the last day of December, 1876, and up to the very last day it was thought that M. Chardon, the well-known amateur, would be the only competitor to enter the lists. At last it was known that three persons would take part in the struggle—M. Chardon, of Paris; M. Rossignol, of Paris; and M. Fabre, of Toulouse.

It may be remembered by many of my readers how deeply I deplored the absence of foreign competition. The great object of the Photographic Society of France in offering the prize was the discovery of an easy dry process for scientific observation in foreign countries, and their intention to generalise the *concours* as much as possible was manifest when they opened it, not to French ingenuity alone, but to international competition. Unhappily their good intention has not been responded to as it ought to have been, for no foreigner has taken a part in the friendly struggle for fame.

M. Davanne, having been chosen as the reporter by the commission, gave a very long and elaborate history of emulsions, in which it was endeavoured to be proved that, although the emulsion process had attained a high state of perfection abroad, it was none the less a French invention. It was to be deplored that, although the photographic journals had been teeming of late with formulæ for emulsions, when seriously tried and experimented upon they failed to yield the successful results claimed for them. In bringing into the historial record the names of some of our well-known English and American emulsion workers it was shown that, alas! too often a mercantile speculation hindered these inventors from stating in a clear and precise manner their formulæ, and, in consequence, failure had always attended those who followed, step by step, the rules as set down by them. Happily M. Chardon had come forward and stated in a clear, precise, and satisfactory manner the means of obtaining an excellent emulsion which, having been experimented upon very tentatively by the gentlemen forming the commission, was found to be good and reliable in every respect. M. Davanne, after explaining how the commission acted in the trials made by them—how the emulsion prepared by M. Chardon surpassed by far those of his competitors—stated that the commission judged that the prize of 1,000 francs should be awarded to that gentleman. The prize was, therefore, handed to M. Chardon by the President amid the applause of the whole of the members.

M. Chardon thanked the Society in a few well-chosen words for the honour which had been done to him, and hoped that success would now crown the endeavours of amateurs and photographers in the making of reliable emulsions.

I am indebted to M. Andra, one of the commissioners, for the exact formula of M. Chardon. I send it in French weights as I received it from that gentleman, so that no error can take place:—

Collodion.

Alcohol	200 c.c.
Bromide (compound)	12 grammes.
Cotton	6 to 12 ,,
Ether	400 c.c.

The bromide is a triple bromide (excuse this false appellation) composed of six grammes of double bromide of cadmium and ammonium mixed with six grammes of bromide of zinc, and thoroughly dried.

Formation of Emulsion.—3·10 grammes of nitrate of silver is dissolved in thirty-five grammes of alcohol, and poured slowly into a hundred grammes of the prepared bromised collodion. This emulsion is allowed to remain thirty-six hours; it is then analysed, and ought to contain a slight excess of nitrate of silver. Three cubic centimetres of the following collodion must be added in order to neutralise the excess of nitrate:—

Alcohol	50 c.c.
Chloride of cobalt	5 grammes.
Cotton	1 gramme.
Ether	50 grammes.

After analysis the emulsion ought not to contain the slightest trace of free nitrate. The emulsion is now poured slowly into a basin of cold water, beating it all the time with a glass rod. Two or three changes of water suffices, and the pellicle is left to dry.

The pellicle is re-emulsioned by taking—

Pellicle	3 to 4 grammes.
Alcohol	50 ,,
Quinine	0·20 gramme.
Ether	50 grammes.

When dissolved and filtered through cotton it is ready for use.

M. Chardon then gave an experimental demonstration on the making of his emulsions. As that operation is so well known to the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY I think it will suffice to give only the formulæ.

Some plates had been exposed and developed before the members. I am happy to say that in this development there is something new, and that it succeeded very well:—

No. 1.

Water	1,000 grammes.
Carbonate of ammonia	20 ,,
Bromide of potassium	40 ,,

No. 2.

Pyrogallic acid	10 grammes.
Alcohol	100 ,,

No. 3.

Water	100 grammes.
Bromide of potassium	1 gramme.

No. 4.

A saturated solution of bicarbonate of potash in water.

No. 5.

Water	80 parts.
Glucose	20 ,,

After exposure the plate is covered with a solution of alcohol and then washed. It is then plunged into a tray containing a sufficient quantity of No. 1 to cover it; two or three cubic centimetres of Nos. 2 and 3 are added; a little of No. 4; and if it do not gain sufficient intensity No. 5 is added until the desired effect is obtained.

The image is now fixed in a solution of hyposulphite of soda.

The meeting was adjourned, the members felicitating M. Chardon on his success.

If the miseries experienced by a poor manipulator struggling with pinholes—the bugbear which has annoyed him during the last few weeks—his fruitless endeavour to discover the cause, and his late victory, will interest and save from these disasters any of the photographic community, he will be amply rewarded for the loss of time and chemicals employed in discovering the cause.

The subject of pinholes has often been brought before the photographic public with proposed remedies, such as adding another salt to the bath, or precipitating the excess of iodide, which was supposed to be the unknown enemy. Others maintained that the fault lay in over-heating the nitrate of silver in the manufacturing of that product, and by so doing causing the formation of nitrite.

For the last four or five weeks I have had too-frequent opportunities for studying this phenomenon, and of judging of its action. One evening as I was preparing dry plates (bath plates), I was surprised to see, in looking from a certain angle, that the plates in being taken out of the silver bath had the appearance as if they had been dusted with a pepper-box, and they increased more and more as I continued the work. I had taken that evening the collodion from another stock-bottle, so I tried the old collodion, which gave me a little dust (I call it so at present) upon the plates. The next morning, on examining my plates by the microscope, I found that they were all spoiled, being full of a foreign substance, and upon exposing one it was completely perforated with pinholes. I now began to seek the cause. I set the negative bath in a pail of ice, and in an hour a great quantity of fine needle-like crystals were deposited on the sides of the bottle, and on the bottom a kind of miniature haystack had been formed. I now supposed it to be the fault of the bath and made a new one, saturated it with iodide, and acidulated it with acetic acid. In an hour it had taken a purple-brown colour. "Undoubtedly it is something foreign in the bath," said I. I experimented upon the distilled water and the silver, and found them pure. I took the acetic acid and tested it with a solution of permanganate of potash, and the acid discoloured it immediately, which proved to me that the acid contained organic matter. I made a new bath with redistilled acid. After having prepared a few plates the same appearance presented itself, and I discovered that if I rapidly washed the plates the dust quitted the plate with great ease; but if the plate had been allowed to remain a very short time in the water without moving, the dust attached itself to the surface of the collodion, and no amount of washing would remove it. I was now certain that the fault was in the collodion, and that some salt had gained access to it. As I had filtered the collodion through cotton I analysed this substance, and found that it contained hydrochlorate of lime. By making new collodion this was found not to be the cause; and, after numerous experiments and carefully collecting the dust which remained at the bottom of the sensitising dish, I at last discovered that the dust was a metallic oxide, which was originated by a badly-prepared bromide. Since that time I have dissolved all my bromide in absolute alcohol, which, being filtered, has completely eliminated all the sub-salts which may have been formed in the preparation. I have no longer been bothered with that plague to photographers—pinholes

Last week a fire took place at the establishment of M. Adam-Salomon, of Paris. In the midst of the conflagration one of the firemen stated to the adjacent crowd (so says a Parisian newspaper) that an elderly man of very respectable appearance was surrounded by the flames. This was thought to be our worthy friend, the celebrated photographer, who was absent at the time. When, after immense exertions, the fire was extinguished, the elderly man was discovered to be a lifelike sculptured portrait of M. Garnier Pagés. I am happy to say that no great and irreparable damage has been done to the renowned artistic establishment of M. Adam-Salomon. E. STEBBING, *Prof.*

3, *Place Bréda, Paris, April* 10, 1877.

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MR. J. W. SWAN'S PATENT.

To the EDITORS.

GENTLEMEN,—I have dabbled a good deal in photographic matters in my time, from daguerreotypes to chromotypes—always *en amateur*—and have thought much more highly of my own productions than other people have. This, perhaps, is natural, and I am benevolent enough to pardon want of taste. But I really think I can do better work in carbon than in silver; at all events I like it better, and the fact of permanency is a satisfaction. I had the pleasure of acquaintance with Mr. Swan years ago, and this brings me to his patent, which, creeping to the period of natural extinction, has yet vitality enough to revive the old controversies. "Nothing new under the sun," said Solomon, and it is amusing how history repeats itself.

I begin a fresh paragraph to deal a blow at your "Peripatetic Photographer," who usually knows what he is talking about, carries a sharp lance in rest to prick a bubble or impale a sophism, and is generally genial and amusing. There's a pretty shake of the hand for him before "hitting out!" What does he mean by saying in your last week's issue that anyone would know "from a two minutes' perusal of Mr. Swan's patent that this gentleman never laid claim to the preparation of carbon tissue as an item in his patent?" The "Peripatetic" must know better than that; he is too well versed in photographic literature to be caught napping in this way; and has, I suppose, only wished to sound the depth of the ignorance of the Glasgow Photographic Association on the subject.

On page 4 of his specification Mr. Swan says:—

> "Now my invention consists in the formation of tissues adapted to the manner of printing referred to, and composed of or prepared with coloured gelatinous matter, and so constructed that, while they allow in the act of printing free access of light to one surface of the coloured gelatinous matter, they also allow free access of water and the unobstructed removal of the non-affected portions of the coloured matter from the opposite surface or back in the act of developing, and I obtain this result either by the disuse of paper altogether, *or by the use of it merely as a backing or temporary support of the coloured gelatinous matter, the paper so used becoming entirely detached from the coloured gelatinous matter in the act of developing, and forming no part of the print ultimately.*"

If the words in italics do not accurately describe the tissue now in use I confess to knowing nothing at all about it. If the "Peripatetic" refers to the final page of the specification, where Mr. Swan summarises, in three short clauses, the claims of his patent, he will find the first to be—"The preparation and use of coloured gelatinous tissue in the manner and for the purpose described."

My personal acquaintance with Mr. Swan and high respect for his great capacity and judgment, as well as a careful perusal of his specification, leads me to doubt gravely the dictum laid down at Glasgow by Mr. Urie:—"That in the provisional specification and the final one different principles are mentioned—an error at once fatal and illegal." Mr. Swan is not a likely man to do things in a blundering way, and just to amuse an idle hour I have indulged myself with the expenditure of sixpence at the Patent Office.

The preliminary and final specifications appear to my non-legal intellect perfectly harmonious without any fatal or illegal error very prominent; but who can feel safe in the dangerous mazes of patent law? It would be absurd in any ordinary individual to pronounce an opinion as to the validity of a patent. My concern is only to point out that the work of Mr. Swan is not open to the animadversions so flippantly expressed. To an array of "big wigs" in the High Court of Justice is the appeal.

The interest of today in the Autotype Company's patents does not centre so much about Mr. Swan's invention as about the process of double transfer, introduced by Mr. J. R. Johnson. The Company evidently looks to this as its stronghold, and can witness the quiet extinction of Mr. Swan's patent with some equanimity if Mr. Johnson's method will give them for another six years a practical monopoly of the carbon process in the phases of most importance to the great body of photographers. Probably the present managers or proprietors of autotype are much too "cute" to set a high legal value on the "patented" improvements of M. Leon Lambert. I was an early visitor to that ingenious Frenchman when he established himself at Greenwich, and produced with very imperfect appliances very much finer carbon work than had been ever seen before. Of this there can be no manner of doubt, and the fact is bearing fruit in the stir and agitation felt today about carbon printing.

The action of the Company was at first distinctly hostile to the innovation. They put in a sort of claim to the improvements as subject to Johnson's patent, and even when they embraced the improvements and purchased the patents they, in a sense, disclaimed them; and when Mr. Urie says he is quite unable to see anything in Lambert's patents to prevent his practice of carbon printing, a good many people who will take the trouble to read the specifications will agree with him. Why the Autotype Company should give a bonus and materials to full or chromotype licensees if the Lambert patents add so much value to their processes is difficult to see; but if it be a "sop to Cerberus" one can understand it. As far as I can by my personal experience judge, the question of relative value of chromotype or ordinary autotype tissues resolves itself into a matter of taste. I can get from autotype brown pictures fully as satisfactory to myself as by Lambert purple. *De gustibus non disputandum.*

I should not like to figure as defendant in an action for infringement, for I confess to a feeling that, if the Company can retain the monopoly of double transfer for the six years Johnson's patent has to run, it has fairly deserved it. It is very well known that autotype has sunk a pile of money in its time, while it has certainly laid a solid foundation for permanent printing of interest and advantage to art and to the photographic profession. But any weak sentiment of this sort is not likely to prevail in a world of clashing interests and the struggle for life. A patent agent told me the other day that almost every successful patent had to undergo "the baptism of fire;" and from signs in your advertising columns the Company appears to recognise and prepare for this eventuality. It will be amusing to look on safe from the risk.—I am, yours, &c.,

April 10, 1877. VETERAN.

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BOISSONNAS' ALBUMS.

To the EDITORS.

GENTLEMEN,—Allow me to say that the two albums of instantaneous and other photographs which were exhibited by M. Boissonnas, of Geneva, at the meeting of the Photographic Society of Great Britain on Tuesday last, are now in my possession, and I shall be very happy to show them to any photographer who feels interested in them and who will favour me with a call.—I am, yours, &c.,

9, *Gratton-road, West Kensington* JOHN A. SPENCER.
(Addison-road Station), April 10, 1877.

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MATT VARNISH.

To the EDITORS.

GENTLEMEN,—In the last number of the Journal I observe that your valued correspondent, Mr. W. Brooks, recommends, in his paper on *Transparencies*, the employment of a matt varnish thinned with ether as a substitute for ground glass at the back of the transparency.

Now, I have succeeded in most matters photographic; but the production of a good ground-glass surface for the purpose indicated is just one of the very things I have never succeeded in accomplishing by any of the dozens of receipts that have been published. If any of your readers can give a reliable method of producing an even film of a semi-transparent matt surface upon glass I am sure it would be a great boon to many others besides myself. In flowing over a glass plate, ever so well cleaned, with a thin matt varnish I find it impossible to get an even surface; drying marks and inequalities invariably present themselves, and, worse than all, the lower portion of the plate is always crystalline or granular, and I cannot prevent the varnish from running up the other side of the plate.

The French makers of stereoscopic transparencies make use of an exquisite preparation, with which they cover their pictures, which excels the effect of the very finest ground glass. Can no one tell us how it is made?—I am, yours, &c., W. H. F.

April 10, 1877.

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CARBON TISSUE.

To the EDITORS.

GENTLEMEN,—Mr. S. Fry, in his letter of the 2nd April in your last week's issue, makes distinct and libellous charges against us. He, in plain terms, accuses us of double dealing and dishonest practices. He says that if a "purchaser asked or wrote for Lambertype tissue he was told it was supplied only to licensees, but he could be supplied with portrait tissue;" and now comes the false and libellous statement that "this was simply the same tissue without the Lambertype label." We assert that Mr. Fry has penned an absolute untruth, and that what he states has not the smallest foundation in fact.

Mr. Fry also *informs* your readers "that until the past week any man could go to the Autotype Company and there purchase, unquestioned, material with which what are known as Lambertype portraits can be produced." This is just as untruthful as the other statement. We have always kept a definite and distinct formula for our Lambertype clients, and have issued the tissue made by that formula to licensees only.

We have for some time been aware of an attempt to organise an opposition to our patents, and have before us letters from influential photographers apprising us they have been solicited to take part in this movement, of which Mr. Samuel Fry has constituted himself the "forlorn hope." It has been asserted by this clique that we do not believe in our own patents—that if anyone showed a bold front we should "cave in." Permit us this opportunity of saying that we have not the slightest intention of "caveing in." We know we can better afford to fight the patents and *lose* them than to take the money of licensees and desert a legal position of the soundness of which we are advised. The existence of the Autotype Company depends much more on the good work, the reasonable prices, and the general advantages offered to the profession and to artists than to any advantage ever taken of the patents; but we shall prefer to fight to the "bitter end" than to surrender our rights.

The founders of the Autotype Company, ten years ago, had prophetic visions of an important future, and demanded a license fee of ten pounds per annum for the use of their patents under the conditions still maintained. This was reduced to one payment of £30; and so difficult did the enterprise become—so far off the harvest—that for a time, to encourage experiment, the tissue was supplied without demanding a license fee. This, considering the difficulties to be overcome, was essentially a wise policy. Until pecuniary value was proved it was idle to demand a price for it; but it must not be forgotten that by acting on this principle the Company bated no jot or iota of its rights to a license fee whenever it should deem it expedient to demand one.

Certainly the Company has not been backward in endeavouring to popularise its processes. Practical information has been given to the world at large in the journals, in the Almanacs, in the many editions of the Autotype *Manual*, and by exhibitions and demonstrations at home and abroad. The best working details have been freely published at all times, and now that the efforts of many workers have brought the processes to something approaching perfection, and opened to the photographic profession a lucrative source of revenue, the present proprietors of the Company feel that their modest demand of a small license fee in acknowledgment of their legal position, achieved only after the expenditure of thousands of pounds, is neither unfair nor unreasonable.

Acting up to the policy inaugurated by our predecessors, and continued by ourselves until a very recent period, we have allowed the issue of experimental parcels of tissue, and, upon noting how mere trial turns to profitable usage, have drawn attention to our claims for a license fee. This was done in Mr. Samuel Fry's own case. He was quite content to profit by the Company's patents without acknowledgment until personally addressed on the subject by our Mr. Bird. His own experience might have warned him that the Company attends to its proper business, and restrained his haphazard pen within the limits of the probable.

The fourth paragraph of Mr. Fry's letter is a concrete blunder. The Company not only has never sold an exclusive license in any town, but actually bought up the Lambert patents in order to prevent the granting of exclusive rights, as being inimical alike to the Company and to the profession at large. M. Lambert, indeed, sold exclusive rights to his processes; but it was never pretended that he sold the pre-existent rights of the Company in its own patents of Swan, Johnson, and Sawyer.

But Mr. Fry's fourth paragraph is altogether so queer a specimen of the Queen's English that it is difficult to make head or tail of it. There is such a confusion of "they" and "them" that we are fairly baffled. If Mr. Fry mean that we sold an exclusive license for a northern or any other city, it is false. If Mr. Fry mean to say that we supplied any Lambertype tissue to any person whatever not a licensee, the statement is equally untrue. The only method that we can discern to put one grain of reality into Mr. Fry's fourth paragraph is to alter the last word of his concluding sentence, so that it would read "every word of my statement that no license was required was absolutely *false.*"

The "comic side" of the incident is not, as Mr. Fry supposes, to be found in the opinion held by any man as to the probable gain or loss to the profession by the existence of the autotype patents, but rather in the Surbiton farce of Mr. Fry posing before the world as the great apostle of carbon printing, moved by glowing moral enthusiasm to make a clean sweep of silver prints, and inaugurate the chromotype—

"Ring out the false, ring in the true"—

and let the great centres of population do their photographic best! Very fine, indeed! but what has Mr. Fry done to justify his position of teacher and benefactor? What improvement has he suggested? What success has he achieved? Why in the discussion on carbon printing before the Photographic Society of Great Britain had he to exhibit specimens of Mr. Sachs' rather than his own? Where are his credentials? Let us not wrong him; he has made a brilliant discovery, and announced it to the world. "No license required;" this is the original Surbiton discovery! How easy to be generous with the property of other people! How pleasant to nett a few paltry pounds, while the dupes run the risk of legal proceedings from—Yours, &c.,

April 9, 1877. THE AUTOTYPE COMPANY.

EXCHANGE COLUMN.

Wanted to exchange, a good quarter-plate mahogany camera all complete, with lens attached, for earthenware trays or a good water-tight bath for plates 10 × 12.—Address, ALLEN GARSIDE, Ripponden, near Halifax, Yorkshire.

ANSWERS TO CORRESPONDENTS.

PHOTOGRAPHS REGISTERED—

William Hoare, Leicester.—*Two Groups of Co-operative Congress.*
Thomas Forrest, Pontypridd.—*Interior of Masonic Hall, Aberdare.*

☞ *Correspondents should never write on both sides of the paper.*

⁂ The pressure on our columns this week compels us to leave over several articles in type.

W. HARRISON (Paris).—Received. Thanks. We shall write.

C. F. C.—The sample we tried was obtained from Messrs. Hopkin and Williams.

W. MOSCROP.—The patent did not pass beyond the provisional stage; hence there is nothing to prevent your making machines of the kind specified.

C. B. B.—1. The kind of glass required is the ordinary flashed opal, which can be procured from all dealers in photographic materials.—2. Plates prepared by the morphia process do not possess good keeping qualities.

A LOOKER-ON.—When the names of the various persons have been given to us we shall then decide upon the use to be made of your letter. In the meantime, are you aware that you have given us a fictitious address?

J. D. PHILLIPS.—We have examined the plate of opal glass left at our office. The stains are those of silver. As to the possibility of removing such stains, let but one drop of nitric acid touch the surface and you will speedily see the effect produced.

GEO. HARDING.—We are unacquainted with the special name of the enamelled paper so well adapted for transferring collodion prints; but upon showing a sample of it to any *large* stationer he will either supply you with it from his own stock or will procure it to order.

SIR THOMAS PARKYNS.—We are entirely at one with you respecting the necessity that exists for careful and systematic tuition in the process, and it is gratifying to know that such tuition may now be easily secured. We quite understand the disinterested nature of your action in this matter, which we correctly assume to be the advancement of the art.

C. T. D. P.—The idea of the publication of a photographic directory has on several occasions received due consideration, and such a step has frequently been urged upon us; but we find it inexpedient to do so for several reasons, one of which will suffice to a business man like our present correspondent—such a publication would necessarily entail a heavy loss on the publisher.

W. S. GEORGE.—It would prove a great convenience to us if, instead of asking "which is the best lens?" our correspondent would select three or four from any one catalogue, specifying the purpose for which he wants a lens, and then inquire which of those enumerated would, in our estimation, be most likely to suit his requirements. Until this course is adopted we must decline to reply to the query.

REV. G. K.—Discard the multiplicity of camera fronts in your possession and adopt a system similar to that which we have had in use for several years, and which consists in having a central flange into which we screw all the lenses we are likely to use in taking landscapes the full size of the plate, a pair of flanges for stereoscopic lenses being mounted on each side of the central flange. If you *must* use a lens of large diameter during an "outing" then have a special front for that particular lens.

METROPOLITAN inquires in what manner spherical aberration can be cured in a lens. To the question as here put it would be wellnigh impossible to reply unless we had previously had answers to a number of other questions which we in turn might put to the querist. We shall here assume—as from his postscript we are justified in doing—that he has got a plano-convex or meniscus lens which he is desirous of using for photographic purposes, but which he imagines is unsuitable on account of its spherical aberration. Let him turn the flattest side of the lens towards the object—a landscape, for example—and after having observed that the image upon the ground glass of the camera is of a very misty character, let him insert diaphragms in front of the lens and at a short distance from it until "fuzziness" ceases and the image becomes sharp. At this stage spherical aberration may be assumed to be destroyed.

PYRO.—Salt the paper on an eight-grain solution of bromide of potassium, and excite on a *strong* bath of aceto-nitrate of silver. Expose while wet.

"A BOULD SOLDIER BOY" (49th Regiment) has been trying a number o experiments with the Blair-Adams dry process, which he believes to be the most rapid process extant of which any description has been published. He thinks that those gentlemen were in error in not recommending a larger proportion of bromide than that given in their formula. This, he says, coupled with the use of a stronger bath of nitrate of silver, and a solution of gum arabic containing so much ammonia as to be distinctly perceptible to the smell, will enable a plate to be prepared that will be slightly superior in sensitiveness to the wet collodion process as commonly practised in the studios of photographers of average excellence.——In reply to this we may state that we also found this to be the case several years ago, and published the fact in this Journal. The one thing we have never tried in connection with this process is the duration of the time the plates retain their good qualities.

EMERGENCY says—"Ever since you published Dr. Kemp's formula for the honey and glycerine process in No. 675, vol. xx., 1873, I have been anxious to try it, but have as yet had no opportunity. I have looked over all the numbers of the Journal but can find no further reference to it. I write to ask you if you have had further experience with the process, and if you still entertain as high an opinion of it as there expressed. Would you advise the same formula, or do you think that any other should be substituted? You would greatly oblige by giving the information asked, as it is a process which, if it gives even nearly as good results as the ordinary wet process, ought to be highly esteemed for its great simplicity."—— We reply: The process described by Dr. Kemp is one with which failure is very difficult, if not impossible, provided a moderate degree of care be taken. We have made repeated use of the process since the date given by our correspondent; and we are also aware of others having used it with excellent results. As a rule we do not like correspondents to write a record of their triumphs with any process of the success of which we have previously been well assured; what we most like is such a record of failure as will lead to the further elucidation of the principles upon which success depends. Unless in one instance, to which reference was made in our "Answers" column, we have never heard of a case of failure; hence the reason for its not having received any further notice.

RECEIVED.—R. H. Anderson; G. Heath; Amateur, &c.

INDECENT PHOTOGRAPHS.—A penalty of £5 in the shape of a fine and twelve months' hard labour was inflicted on Monday last on Grattridge, the Birmingham photographer and bookseller, for vending immoral pictures and literature. One of the condemned books included *Fruits of Philosophy*, for selling which Mr. Bradlaugh and Mrs. Besant were arrested.

EXPERIMENTS WITH PINHOLES.—In our report of the late meeting of the Photographic Society of Great Britain we last week gave an outline of a short paper read by Mr. F. York. We are now enabled to give Mr. York's remarks *in extenso*. They are as follow:—"I should like to state the results of a few experiments I have made since the last meeting. I am rather sceptical about the sulphate of silver theory as to the cause of pinholes, being unable to account for the introduction of sulphuric acid into the silver bath. Dr. Vogel traces it to the supposed contamination of the sensitising salts with sulphate of potash. I think the manufacturers of collodion would not be likely to use commercial preparations, but those specially prepared for photographic purposes. Mr. Sawyer puts it down to the sulphuric acid used in the manufacture of the pyroxyline. I think that manufacturers of collodion, knowing the destructive properties of a free acid in this preparation, would take the greatest precaution to eliminate every trace before converting it into collodion. Nitrate of baryta, when added to an exhausted bath, produces a white precipitate. It is a most reasonable conclusion to arrive at, that this precipitate is caused by the presence of a sulphate. My experiments tend to show that a bath purposely saturated with sulphate of silver, which gives a marked precipitate with nitrate of baryta, does not give pinholes, but works in the most satisfactory manner. The plates produced are examples; the bath used was one which gave pinholes in abundance, until renovated by the addition of nitrate of baryta. No. 1 is the bath treated with sulphate of potash; the result is a mottled sky, similar to an over-sensitised collodion. No. 2 is another portion of the same bath treated with sulphate of soda; the result is similar, but not quite so objectionable. I then precipitated the sulphate of silver with nitrate of baryta, and No. 3 is the result—a most desirable negative with clean sky. I then saturated the bath with pure sulphate of silver, precipitating all the nitrate of baryta; the resulting negative, No. 4, is also satisfactory, with an entire absence of pinholes. We may conclude from this that nitrate of baryta acts the part of a sanitary inspector by removing the objectionable matter, and that sulphate of silver removes the excess of nitrate, thus rendering the bath comparatively pure as regards the barium salt used in correcting it. From these experiments it is important to use pure sulphate of silver, and not to generate it in the nitrate of silver bath by the addition of sulphate of soda or potash.

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 885. Vol. XXIV.—APRIL 20, 1877.

ON COLOUR PHOTOGRAPHY: ITS PRESENT STATE AND FUTURE PROSPECTS.

The question of the solution of the difficult problem—how to render in their natural colours by means of photography the various objects in nature which we are at present content to represent in monochrome—is one which, though not occupying the attention of the mass of photographic experimentalists, has still of late been subjected to a sufficient amount of research to bring it within the bounds of photographic industry; that is to say, though we are at the present time no further advanced in the production of coloured impressions in the camera than we were a quarter of a century ago, there are at present at least two methods by which photographs in colour are claimed to be produced, and which their originators assert are capable of reproducing, with the greatest exactitude, the various chromatic effects of nature.

We allude here, of course, to the two systems of MM. Leon Vidal and Ducos Duhauron; but, as most of our readers are aware, neither of these processes consists of photography pure and simple, nor are the colours formed by photographic means or to any great extent, except in the latter case, by the discriminating power of the coloured rays. They consist, on the contrary, of a skilful utilisation of photography to the formation of the outline, which is afterwards filled in with the various colours by more or less mechanical means, combined, as may be supposed, with the exercise of a very considerable amount of artistic taste as well as of manipulatory power. These processes, however, strictly speaking, do not come under the head of what we should prefer to consider chromo-photography any more than an elaborately "finished" picture in monochrome can be fairly classed as a photograph; but they are still none the less worthy of our consideration, representing, as they do, the only direction in which colour photography is now being pursued.

Let us say a word or two as to the legitimacy or otherwise of this class of reproduction. The primary object in all attempts at pictorial representation is to secure a copy, as nearly correct as is possible by the method employed, of the object or scene delineated. We cannot attempt to rival nature, and our efforts are limited in their approach to truth by the capabilities of the method employed and the skill of the artist, whether the instrument be the brush of the painter or the lens of the photographer. The means adopted may be considered as of little importance provided the end we aim at is attained. Now, photography is capable of rendering with the greatest possible truth transcripts from nature which only require the addition of colour to make them perfect; if, therefore, by other means the needful colour can be added we approach one step nearer the goal, and the value of such step is to be estimated by its approximation to the reality. But the gradations of light and shade in an ordinary photograph are obtained direct from the objects depicted, and by the action of the rays of light alone. Not so, however, the colour photographs, so called; these necessitate the intervention of artificial means to bring about an artificial result which depends for its value upon the skill of the operator. Let us, then, be content to regard these productions, not as photographs, but, when they attain a stage worthy of that designation, as works of art. Let it not be supposed that the attainment of the real object—the formation of a coloured picture in the camera—will reduce photography to the state of a mere mechanical art. Far distant be the day when artistic feeling shall be no longer necessary! The "royal road," however, is not yet reached, as the trashy work we daily meet with abundantly shows.

Having said so much on the general principles of colour photography, let us now turn to the various methods which have been followed in their practical application. First—both as regards priority in point of date and as possessing the greatest importance as a principle—we shall deal with the systems of MM. Niepce and Edmond Becquerel. The former *savant* performed his experiments principally upon silver plates similar to those employed in the daguerreotype process; while the latter made use of surfaces prepared with the violet sub-chloride of silver. Both systems, however, were similar in so far as the colours were formed by the action of light alone and without resorting to any artificial means. We need not enter into the details of the methods employed; suffice it that they remain in the same state as their originators left them years ago. Though several of the spectrum colours were obtainable no success attended the attempts to fix them; and, furthermore, neither process was applicable to the purposes of exposure in the camera, owing to the length of time necessary to secure an impression.

The question has frequently been raised as to the ultimate possibility of producing coloured pictures by such means as the above, which we may consider as purely chemical; and certainly the obstacles in the way of success appear in the present state of our knowledge, though at any moment some new discovery in the chemistry of the art may make the way clear. It has been doubted whether it is possible, with any of the known metals, to secure a sufficient range of tints to cover the whole of the spectrum, and though this appears a well-founded objection, there are several known facts which afford some slight hope of ultimate success. The production of various tints by the action of heat upon polished steel during the process of "tempering" forms an example, and proves that a single metal may, under varying conditions, exhibit very different characteristics. Heat has been likened by some to "invisible light," and if such effects are obtainable by its means there is no reason why they may not also be produced by light One circumstance is worth noticing, namely, that the temper colours run *almost* in the order of the colours of the spectrum, the tints corresponding with the less refrangible rays appearing under a low temperature, and as the heat is increased the various shades of violet and blue are reached. The production of these colours is not confined to steel, as they may be obtained, though not so distinctly, by heating polished copper or brass, while a third instance of the production of different colours upon the same metal is to be found in the action of iodine upon metallic silver. If a small lump of iodine be placed upon a polished plate of silver a series of concentric rings will be formed, which exhibit nearly the whole range of prismatic colours.

These examples show that we need not look upon the production of a wide range of colour upon the same surface as an impossibility;

but there are other difficulties which stand more prominently in the way of research in this direction. To our mind the nature of the principle we are in search of involves in itself the greatest difficulty of all. What we want is a surface sensitive to *colour* independently of light, and how are we to know that even the films we now employ are not sensitive to colour could we but fix the impression when formed? Let us suppose a sensitive collodion film, such as we ordinarily employ, to be prepared in total darkness: it is quite possible that in that state it is susceptible of impression by the coloured rays; but the moment it becomes visible to the eye (which necessarily involves its exposure to *light*, though not to *actinism*) that susceptibility is destroyed by the uniform action of the light over its whole surface. We merely put this forward to express our meaning, which may be summarised in the following theorem:—Given a surface capable of receiving a coloured impression: the image must be formed, developed, and fixed under conditions which preclude all possibility of our watching the operation—that is, in total darkness. This being so, we are obviously placed at a very considerable disadvantage in any researches in this direction.

Pending the removal of the difficulties attending the purely chemical methods, we must be satisfied to study the ingenious attempts which are now being made in the direction of colour photography, and which, though not scientifically perfect, at least offer a practical and industrial solution of the question. The first of these which we shall notice is the process of M. Leon Vidal, which is at the present time worked upon a large scale commercially in Paris, and the results of which have been well spoken of by those who have had the best opportunities of judging. We are not fully acquainted with the details of the process beyond the fact that it is a combination of photography with mechanical printing, in which an ordinary negative is utilised in the production of the various *clichés* which are used to combine the different colours into the *tout ensemble* which forms the picture. It is obvious that the productions of this method owe at least as much of their success to the artistic and mechanical skill of the operator as they do to photography, and, strictly speaking, can scarcely be ranked as photographs. Moreover, there are technical difficulties connected with the process which partially unfit it for the production, at least industrially, of certain classes of subjects, though in course of time (for the process is still young) these may be surmounted.

M. Ducos Duhauron's method seems to be more in accordance with scientific requirements, but less practically applicable to industrial purposes. This gentleman's method is based upon the theory of the three primary colours, which combine in various proportions to form every known tint. It is practically applied by producing three distinct images on the simple colours, each of which represent the object pourtrayed in its proper gradation of one particular colour, and, when superimposed, the combination of the primary tints forms all the necessary colours. Each of the three "monochromes," as M. Ducos Duhauron styles them, is produced by interposing between the sensitive plate and the object to be reproduced a glass of the *complementary* colour. This, at first glance, appears to be a rather anomalous proceeding; for it is evident that the result is the absorption or stoppage of the whole of the rays it is desired to secure.

Here, however, is displayed the ingenuity of the process. If for the production of each monochrome a screen of the same colour were employed the result would be that the negative would represent that particular colour by black and the two remaining ones by transparent glass, while the coloured print would be marked by an entire absence of the colour desired just where it should exist, while it would predominate in portions of the picture whence it ought to be absent. By substituting a screen of the complementary colour, strange as it may appear, the monochrome is formed by entirely suppressing the colour it is desired to reproduce. Thus, take the blue monochrome: a screen of the complementary colour orange is used, which arrests the blue rays and transmits the red and yellow, forming a negative image in terms of the latter colours, while the blue rays are represented by a proportionably diminished action. If, then, this negative be employed in the production of a positive image in blue pigment that colour will be reproduced in the same proportion as in the original; for the transparent parts of the negative (formed by the entire suppression of the rays emanating from blue objects) permit the passage of the whole of the light, therefore producing the strongest colour, and so in proportion to the quantity of blue arrested by the complementary screen will the tint vary in the positive.

The three monochromes produced in this manner now require to be combined, which is done by superimposing the three monochromes upon a suitable support, so that by blending in different proportions the various tints of the original are reproduced. Here we meet with the great difficulty of the process; for it is clear that unless special precautions be observed the two colours first laid down will be entirely lost in the third. It is absolutely necessary that transparent colours be employed, and (though we have not seen any of M. Ducos Duhauron's productions) we should imagine that even then but a very imperfect result is obtained when the picture is viewed by reflected light. If the three films be mounted upon glass and viewed as a transparency—as we believe was the plan first adopted by M. Duhauron—the effect would doubtless be better; but unless the capabilities of the process be extended beyond this limit it will not be found of much practical use. Such as it is, however, it contains the germs of a practical and, at the same time, theoretically-correct principle, and as such deserves our attention. We must, however, wait awhile before we endorse all the claims which the enthusiasm of its author leads him to make on behalf of the process.

We have left entirely out of consideration such technical objections as the difficulty in obtaining really pure colours both for the pigments and the screens, the objectionable and delicate nature of the manipulations necessary in some portion of the process, and the necessity for three separate exposures. Our intention has been merely to speak of the process solely in its theoretical connection with light and colour.

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CONFERRING STABILITY ON RICKETTY CAMERA-STANDS.

We have on two previous occasions brought before our readers the subject of the oscillation of the landscape camera when mounted upon a stand inadequate for its steady support, especially when exposed to gusts of wind tending to cause vibration. We are again induced to return to this subject owing to the prevalence of the use of the alpenstock camera-stand—a stand possessing so many advantages, as regards compactness, that, for small cameras used during such passing visits to one place or another as tourists are apt to pay when out for a holiday, we cannot do otherwise than bestow upon it our hearty commendation.

The alpenstock camera-stand when folded together forms a round stick shod with iron at its lower extremity, and having a cap on the top. It forms a most useful appliance when the landscape photographer is travelling *à la* knapsack fashion, more especially in localities where climbing must alternate with walking. But it is as a camera-stand rather than a walking-stick that we at present examine the capabilities of the alpenstock, and in doing so we view it as a type of all light camera-stands.

When a tripod is slight in construction vibration necessarily follows if the camera be heavy and the wind strong. But, by the system of counter-triangulation so ingeniously applied to portable stands, the greatest possible amount of rigidity is secured with the least expenditure of material, and stability is further secured in the ratio of the width apart to which the halves of the split legs of the camera are extended when opened out for the support of the camera, or, in other words, to the dimensions of the triangle which forms the junction of the three split legs.

But in stands of the extremely portable kind which close together in the form of a round stick, the *head* is so small that, instead of a large triangle, the table upon which the camera is supported does not exceed an inch or two in diameter, and to this is due the fact of the instability of the camera under the circumstances to which reference has been made.

A simple and excellent method of preventing vibration, when photographing during a gale of wind, was described by us in our first article on this subject, now over ten years ago. It consists in attaching a piece of strong string to the screw by which the camera is fixed to the stand, and bringing it down to the ground, holding it firmly under the foot. This method is one of great value when the camera head is tolerably large; but we have not found it equally efficient with light stands of the alpenstock character.

By adopting the following expedient a great degree of rigidity will be imparted to a stand of even the lightest construction:—A light rod of wood, the thickness of one's little finger, is attached to the camera in such a manner as that it shall project from both sides to the extent of several inches. Two such pieces may be employed, each being screwed into or otherwise attached to the camera, so as to project in the manner described. Instead of wood these projections may be formed of metal wire of the thickness of a small cedar pencil. To the outer end of each of these straight horns is attached a piece of string, which is brought down to the ground and attached to the foot of the leg of the stand which is on that particular side. We have found that a small hole through each leg, at a distance of about an inch from the end, answers every purpose.

When the camera is mounted upon its stand, and the view adjusted and focussed, it is only necessary that the strings be passed through their respective holes near the ends of the legs and pulled till the latter are firm, and afterwards being pinched or otherwise secured to retain them in this rigid position.

The effect of this contrivance is to impart to the camera-stand a degree of rigidity similar to that which could otherwise only be secured by the adoption of a stand having a large triangle. We have tried this method during a brisk gale, and are quite satisfied of the advantage secured by its adoption; and this being so, we can strongly recommend it to those tourists who find it expedient to employ light cameras without having to resort to the use of substantial camera-stands.

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MODERN PRINTING.—ALBUMENISED PAPER.

On looking over some old memoranda respecting the albumenised paper in use at the time, we noticed a much larger number of names and kinds than it is likely would be observed at the present day. Rives occurs but rarely; Saxe is generally to the fore. We remember conversing with one of the largest manufacturers of albumenised papers, some dozen years ago or more, and he informed us that for one ream of Rives paper albumenised that went out of his works more than a dozen of Saxe were despatched, all the large houses, he said, in a general way using Saxe. Looking, now, at the present consumption of the two kinds, we think that for portraiture the proportions would be the exact reverse of this amount, and for views generally and large work the number of reams of Rives and Saxe used would almost counterbalance one another. But as among those who use paper in smaller quantities we have reason to believe the properties of the two kinds are not fully understood, we think it may be of service to them and others if we indicate the leading characteristics of the two kinds now most in use.

Rives paper for portraiture has decided advantages. It is hard in texture and more opaque and full of body in the whites, which have therefore a solidity and purity quite distinguishable from those of the Saxe, with, consequently, more delicate rendering of detail in the lighter half-tints. Its most conspicuous inferiority to the Saxe is what might be called mechanical, the annoying fault of blistering occurring much more frequently with it than with its rival. Care in albumenising seems of late years to have enabled the albumeniser to cope with this difficulty rather successfully, and the fault is much less frequently observed than it used to be; but it is still far too frequently present for the comfort of many a printer. The cause of it must be found in differences in the sizing; but as this is the principal cause of the practical difference between the photographic qualities of the papers it would seem useless to look for a remedy in the raw material itself; we must still depend upon the albumenisers.

Some short time ago a particular make of Rives was sent into the market, being specially manufactured to meet photographic requirements. It was made free from inequalities and metallic spots, and was generally represented to be the utmost possible embodiment of perfection in paper manufacture. We had the opportunity of trying a few sheets at various times ourselves, but did not, practically, find any advantage from its use; indeed, it seemed to lack some of the essential qualities we had been in the habit of attaching to the name of "Rives."

There is no doubt that the presence of the metallic spots in Rives paper constitute one of the greatest drawbacks to its use; and, in the production of vignettes, cameos, or for any style where large spaces of pure white are to be seen, numbers of finished prints have to be rejected on this very account, the most annoying thing about them being the fact that they are mainly only visible after the process of toning and fixing. Of course, large spots may be detected, after sensitising, upon close examination; and careful printers always select their pieces, after cutting to sizes, in such a way as to ensure the rejection of all conspicuously-marked ones, and the careful placing of the less strongly-marked pieces in such a way as to ensure the spots being in a part of the print where they would not be noticed or would not be detrimental to the general effect.

About ten years since several of our professional friends who had discovered the particular merit of Rives for portraiture, and were in the habit of using it, complained to us that they had met with samples of a certain year's make of paper which it was utterly impossible to work in consequence of the great frequency with which these metallic spots made their appearance. But we are told—and such is our own experience—that of late years, either through improved machinery or greater care in sorting the rags, they are comparatively seldom met with.

A striking difference between the old albumenised paper and the new is the varying proportions of salts to albumen now to be noticed in the various papers in the market. Formerly, in heavily-salted paper, ten or fifteen grains to the ounce was understood to be the common proportion adopted; but at the present time there are few manufacturers who do not make a four- or five-grain paper. In many cases this has been done to meet an outside demand made on the score of so-called economy—a fallacy we have so frequently commented upon on previous occasions as not to need to be further dwelt upon now. Certainly most excellent results have been and are commonly obtained on such papers; but we are strongly inclined to think that in point of brilliancy, not to say permanency, the balance of advantages is in favour of the more highly-salted papers.

There is, likewise, a greater latitude shown in the selection of the sensitising salts than was the case in the old sulphur-toning days; but this part of the subject we shall leave for the present to be dwelt upon more fully at a future time, as, though it is now more the manufacturer's province than the consumer's, so few nowadays albumenise their own paper, we yet are always of opinion that the fewer secret preparations employed, and the more fully is every process and formula made public, the quicker and the more complete will be the elucidation of the theory, and the consequent improvement of the practice, of photography in every direction.

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The bright weather we have been favoured with at intervals during the last week or two has enabled us to resume our trials with M. Sammann's hydrosulphite of soda developer, and we are glad to be able to record a better series of results. It will be remembered that in our last account we had to complain of a difficulty in obtaining printing density as well as a want of clearness in the shadows, arising from the formation of a slight veil over the whole surface of the film. We had then only employed one kind of emulsion—a washed one made from high-temperature pyroxyline—and we hinted that the defective results might possibly be due to some peculiarity of that particular preparation. Our most recent trials have proved this to be indeed the case; for, having applied the new developer to several descriptions of dry plates, we have failed to meet with a recurrence of the abnormal veiling, and in most cases have met with no difficulty in securing any desirable density. Our first trial of the new series was with an ordinary collodio-bromide plate prepared with excess of bromide, and the quality of the result was in every way equal to what would have been obtained had we employed alkaline pyro.; while with a given exposure a greater amount of detail was obtained with the hydrosulphite. A washed emulsion made from a less organic sample of pyroxyline than we have been in the habit of using was next tried, and in general behaviour the plates were a considerable improvement upon those previously prepared with washed emulsion. There was no trace of the objectionable fog; but in the matter of density these plates fell short of the collodio-bromide ones, though a slight decrease in the time of exposure was secured. We next prepared a few plates by the bromide process with the bath, using a preservative consisting of tannin and gum. The action of the hydrosulphite developer in this case was different in character from what we had previously experienced; with the emulsion plates the image attains *almost* the full density in a few minutes, and a lengthened application adds but slightly to the opacity of the deposit. With the bath plates, however, the development is slower and more regular; and, though a longer time is necessary for the production of printing density than with emulsion plates, it is possible by continuing the action to build up the image to an extraordinary degree. A single bromo-iodide plate prepared with the bath gave a result not altogether satisfactory, though the fault may possibly rest with the exposure. The high lights were obtained of great density, but the finer details refused to intensify, and were scarcely more distinct at the finish than at the commencement of development. We hope upon resuming our experiments with bromo-iodide films to be able to remedy this state of affairs, otherwise it appears that the new developer is quite unsuited for employment upon films containing iodide.

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OXYGEN-PRODUCING APPARATUS.

[A communication to the Manchester Photographic Society.]

I HAVE another change in oxygen machinery to show you tonight; but before I open my budget I must first congratulate Mr. Chadwick on his production, in that line, at the last meeting of this Society.

It appears to be clear now that there are only two ways of using a mixture of chlorate of potash and manganese—either it must be in the loose state, dry; or damped and moulded into solids of any convenient shape. The first condition will belong to all fixed plant and filling gas bags for customers. The second relates to portable apparatus. The fastening of the plug to the bottom of the inside of the retort has always been a great hindrance. Mr. Chadwick has grappled with this difficulty in his cakes by having a substratum of manganese only in contact with his hot cast-iron plate.

During the last two years or so I have tried several ways to stop the adhesion. First, I coated the inside of the retort with a thick wash of whiting and water; also with clay wash. These did pretty well for one or two plugs, but the coating came off soon, and had to be renewed. As this was unsatisfactory I tackled the plugs themselves; some were chalked all over, and others had whiting, red ochre, and clay wash. The wet plugs from the mould were covered with fine black oxide of manganese, but they were too tender to bear rolling in it; all this involved more labour and time. Then there was the swelling of the plug when the gas came off. The obvious remedy for this is to have the retort larger inside. When a plug is too large it not only is cemented to that part of the metal it rests upon, but fills up the inside so much that there is no getting it out comfortably. This defect I tried to remedy by making a hole through the other end of the retort. I could then drive the plug out. This involved an additional quantity of tackle for closing that hole. I afterwards made a retort tube of equal bore throughout. This was used at Mr. Brothers' lecture on the transit of Venus, and it is now part of the new machine, with the exception that it would be better if of a larger bore. I cannot see that there is any room for further improvement, the connecting or disconnecting being so prompt.

This new arrangement may be considered to be of the parallel vice type; in fact, it is one, the jaws being "steeled" by two brass cups for holding the retort tube over the nine jets of aërated gas. The retort tube has a temporary handle fitted to it, and this tube so provided is the only loose article about the machine. The tube will generally be hot, but need not be touched, so that that objection is put out. Apparently the next serious difficulty is getting the cooked plug out of the hot retort. On the supposition that the bore of the tube is large enough to allow for the expansion of the plug, there remains only the adhesion to overcome; when that is broken all the rest is easy. To do this I intend to make a screw pusher; there will be an abutment similar to one of the vice jaws, provided with a brass cup having a hole through as large as the bore of the retort tube; at the other end there will be a screw. One end of the hot retort tube will be put to the abutment, a few turns of the screw at the other end will soon make the plug move on, and that difficulty will have been got over without any special preparation of either the retort or the plug. I am certain this will be the result. By slackening the grip of the vice a little the retort may be rotated nearly two-thirds of a revolution. When I first began to make plugs I dried them on the top shelf of the oven. I could smell them, and having an idea that I was driving some of the oxygen off I gave up that practice and let them dry slowly.

The easy rotation of the retort tube pointed to a theory I had. My impression was that, although a plug appeared to be dry, it yet contained water of crystallisation in the chlorate; that this water came out as vapour, condensed on the colder parts, ran down to that part of the plug resting on the bottom, wetting it, and so causing the fastening. Now, I thought by turning the retort tube backwards and forwards it would be a preventive, as the plug could roll more than half a revolution. Upon trial the plug stuck as fast as ever. The next experiment made was to find whether this water came over as surcharged steam with the oxygen. The washing bottle was weighed, some short pieces of plug were cooked, and when the bubbling had ceased the washing bottle had increased in weight six grains. This was but a rough experiment, and intended merely as a preliminary.

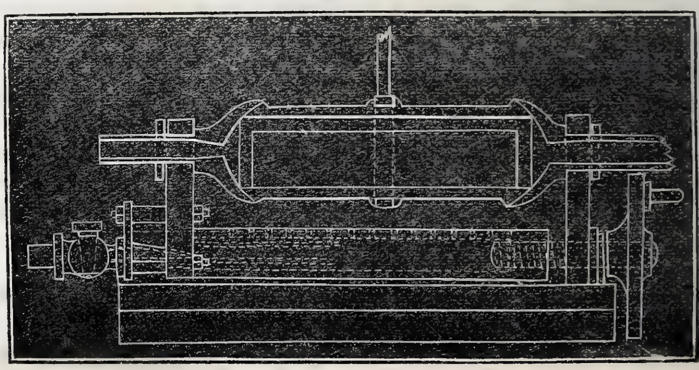
The next point was to find out whether a low temperature would drive off any oxygen. I expected it would, as I had frequently smelled something when drying the plugs in the oven. A plug weighing 686 grains was put into one of the old retorts, a bent copper pipe screwed into the union, and the other end connected to the small washing bottle. This at the outlet was connected to a tube for delivering the gas under water into an inverted bottle full of water. The retort was put overhead in water in a can; the temperature was gradually raised to the boiling point, but not a bubble was obtained. Table-spoonsful of salt were added at intervals, and the temperature of the solution noted till there was a boiling saturated solution; not a bubble appeared. The boiling was stopped, the retort taken out, allowed to dry and cool a little, when I found the pipe screwed into union was slack, but not so slack but that if there had been a fair evolution of gas there would have been some bubbles. The plug was taken out, and found to have lost in weight six grains. It had not changed its appearance at all, and there was no alteration in bulk. The plug was then cooked in the new machine and gave 602 cubic inches of oxygen, being at the rate of 4·74 cubic feet per pound of chlorate. It fastened to the bottom of the retort tube as usual, or worse, as it was clean.

The next day I made another trial, leaving out the washing bottle and carrying a continuous pipe from the top of the retort to the neck of the inverted water bottle. A plug weighing 696 grains was subjected to the heat of the salt water, as before. Very small bubbles, about one a minute, passed up into the bottle as the temperature rose; the boiling was continued for half-an-hour and then stopped. I had about one cubic inch of bubbles in the bottle, which did not stimulate the red-hot end of a bit of lighted stick just blown out, so I concluded that it was simply expanded air from the retort. The plug was turned out, and found to have lost four and a-half grains only. It was quite unaltered in appearance or bulk. I have thus got at this fact—that a dry plug is not decomposed by a heat of fifteen degrees above boiling water.

Then comes another question:—Will a wet plug give off any gas? And then, another:—What is really the temperature when full decomposition begins? These questions must stand over for the present. I am glad I have solved one.

I now return to the machine. Knowing that a diagram goes farther in giving an idea of a thing than mere words, I have made

FIG. 1.



an elevation *(fig.* 1*)*, a plan *(fig.* 2*)*, a left-hand end view *(fig.* 3*)*, a right-hand ditto *(fig.* 4*)*, and a photograph *(fig.* 5*)* of the machine itself, now on the table. In the elevation a plug, four and a-half inches long by one inch diameter, is represented as in a retort tube, five inches long by one and a-quarter inch bore. The ends of the retort tube are convex, and a handle midway is provided for. Each of the concave cups is shown with an outlet, but one will be sufficient. That part of the "vice" which is usually the screw-box is here made into an aërated gas burner as well, the gas and air going in at the left-hand end, the drawing-up screw working in the right-hand one.

FIG. 2.

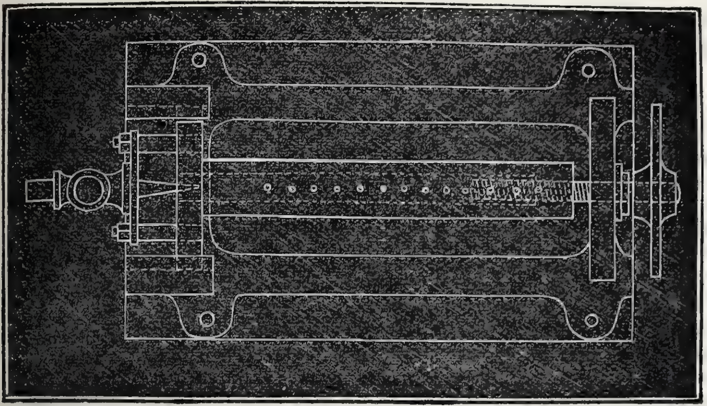


FIG. 3.

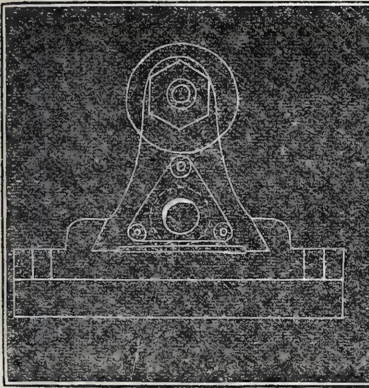


FIG. 4.

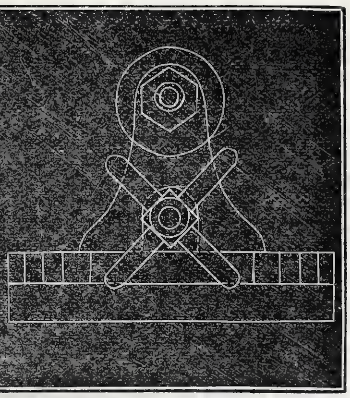
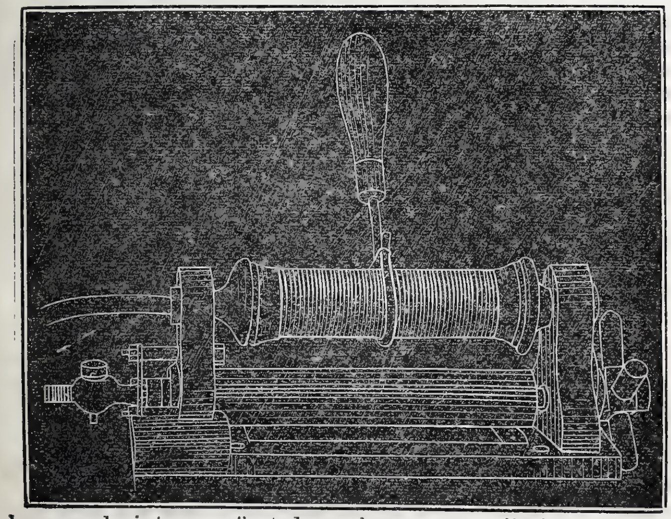


FIG. 5.



The machine may, or may not, be permanently connected to the gas holder; in the latter case it may, like Mr. Chadwick's, be placed almost anywhere, only requiring a flexible tube to first connect it to the washing bottle, and from there to the top of the gas-holder.

M. Noton.

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NOTES FROM AMERICA.

Pending the temporary retirement—and we are glad to be able to say it is only temporary—of our esteemed American *confrère*, Mr. M. Carey Lea, from whom we hope to receive shortly a communication for publication, we believe that a few notes and memoranda bearing on the theory of our art-science and its practical application in America may be welcomed occasionally by our readers. These we shall cull from every available source, and, when necessary, intersperse them with our own observations.

A New American Journal.—American Fashions in *Carte* and Cabinet Mounts.—The Blue Glass Mania.—A New and Unpatented Carbon Process.—Reducing the Intensity of Negatives.—Death of Mr. S. W. Hall.—Panoramic View of the Centennial Grounds.

It has already been announced in these pages that a new photographic journal was about to be started in St. Louis, Mo. This is now *un fait accompli.* Mr. J. H. Fitzgibbon, of that city, in January last issued the first number of the *St. Louis Practical Photographer.* Mr. Fitzgibbon is, we may observe, the permanent secretary of the National Photographic Association of the United States, has long been known as an energetic professional photographer, and, if we are to judge from a portrait by which the first number of his journal is embellished, we should say that he is "a jolly good fellow" and by no means an ascetic. The *Practical Photographer* appears to be warmly devoted to the cause of carbon and of Lambert; and in this connection we find in it articles which deal with the subject in a less abstract manner than is considered in this country to be in accordance with journalistic usage. We trust that such thunder as may be in the atmosphere of America will never become developed to any greater extent than at present, but that such personalities as now prevail will rather be moderated if not altogether cease. America is a large country, and it can easily afford to "run" several photographic journals, each of which may be energetically conducted without any occasion for an airing on either side of the all-powerful organ of combativeness.

From an article by the editor we find that the following fashion in mounts for *cartes de visite* and cabinet pictures prevails in St. Louis:—

> The most generally used is thick or heavy round corners, light buff, dark buff, green, grey, white, or rose tint. A finer quality of cards are light buff, dark buff, white and amber, with broad red corners. Another first-class card-mount is white, cream, opal, silver grey, rose tint, violet, primrose, green, fawn, steel grey, or drab. The most fashionable colours of enamelled are chocolate, white with gilt and tinted lines, pearl, pink, buff, green, rose tint, and primrose. The finest quality and fashionable are the cream, pink, pearl, buff, or green, with gilt lines. Also, white, primrose, green, pearl, pink, black, or chocolate, with broad gilt and red borders. The tinted backs, fine quality, are becoming very popular.
>
> The cabinet mount mostly used has round corners with figured and tinted backs; white, pearl, pink, green, and primrose enamelled backs and unenamelled faces, with broad gilt borders. The finest used and most popular at present are black or chocolate colour, enamelled on both sides, with broad gilt borders. The colours most in demand for a cheaper card-mount are amber, green, pink, and violet, with gilt lines; also black, maroon or dark green enamelled backs, and unenamelled amber-coloured faces.

As Mr. Fitzgibbon has requested us to lay his pages freely under contribution, we shall certainly have pleasure in doing so.

Starting with the assertion that it is quite erroneous to suppose that anything can be added to light by passing it through coloured transparent substances or by reflecting it from coloured surfaces, the *Scientific American* devotes an article to exposing the ignorance of those who ascribe to blue glass a special chemical or curative influence. Our contemporary observes:—

> Some photographers have used blue glass long ago, in order to moderate the intensity of the light for the eyes of the sitter without robbing it of too much of its chemical activity; and those photographers who possess common sense or experience know that, far from adding to the effect of the light, the blue glass is an impediment, and the necessary time of exposure is rather extended by its use than otherwise. It is strange that such errors can prevail for years when a simple experiment would settle the matter. All that is necessary is to photograph the solar spectrum, to do the same with a surface painted with a number of various-coloured pigments, and also to expose a sensitised surface under a series of coloured strips of glass. The writer of this article did this more than thirty years ago by the Daguerrean process, and satisfied himself about the following points:—1. The chemical effect of the prismatic spectrum extends, for iodide of silver, from beyond the violet to the blue. 2. When bromine is used in connection with the iodine it extends to within the green, while the yellow and red rays appear to have no effect on silver compounds, but may possess it for other substances. 3. In photographing pigments there is the utmost diversity in the results, according to the nature of the pigment—much greater than the differences in shade would lead us to expect.

As a general thing, the pure reds, orange, and yellow, such as are produced by vermilion and chromates of lead, are photographically inert, and give blacks. The blues are the most active, most of all being ultramarine, next the violet lakes. But even the red carmine takes well, as it has a violet shade; but among the blues those bordering on green take least, and hence foliage tends to give dark effects, which are only slightly corrected by using bromide. 4. In using as negatives strips of coloured glass to print in sunlight much depends on the shade and intensity of the colour. In general, the chemical effect follows the prismatic series from red to blue; but the most effective blue glass is always found to be far inferior to the sunlight alone, pure and simple. And this fact is sufficient to settle the question about the special virtues claimed for blue glass; it cannot possibly have any not already possessed by sunlight. However, if people are induced by its pretended curative properties to take sun baths, which they otherwise might neglect, they may be often benefited by the salubrious influence of the radiation of the mighty orb—an influence which cannot sufficiently be appreciated; but the blue glass would probably get the credit which exclusively belongs to glorious old Sol.

Premising that in America (as in Europe) there is a lively interest felt in connection with carbon patents and processes, Dr. Vogel publishes in the *Philadelphia Photographer*, an unpatented process by M. Friedlein, of Munich, by which pigment pictures may be produced. Dr. Vogel says:—

For a sensitising bath he uses—

Bichromate of potassium	30 parts.
Water	800 ,,
Carbolic acid	1 part.

For transferring and developing, Mr. Friedlein takes, if a single transfer only is necessary, a separately-prepared rosin-paper.

First, dissolve thirty parts of rosin or white shellac in one hundred parts of strong alcohol, and filter.

Second, dissolve thirty parts of gelatine in five hundred parts of warm water, and filter. To the clear solution add five parts of glycerine.

Mix both solutions, first and second, when warm, and keep it in well-corked bottles; put a coating of the warm solution on Rive's paper, not too thick, and hang it up for drying.

To develope a sensitised carbon tissue on this paper, it and also the tissue must be dipped in water; take both out, and press them together with the squeegee; afterwards press them a short time between blotting-paper. They are then to be developed by means of warm water. They are inverted in position, and without gloss. If the prints are desired to be glossy operate in the following manner:—

Dissolve eighty parts borax in 1500 parts of water, and add afterwards to the boiling solution 300 parts of shellac. Boil several hours till the lac is entirely dissolved. Afterwards add to four parts of the cold solution one part of alcohol, and filter. A little bit of carmine added to the solution will give it a nice colour. As soon as the picture is rinsed with cold water the shellac solution is to be poured on in a similar manner to collodion; then dry the picture, after which it shows a very fine albumen gloss. For a double transfer Friedlein recommends only glass. He does not think much of a double transfer with flexible support. He pours over the glass plates a solution of thirty parts of gum dammar in 400 parts of benzole. Shake the gum at first, in a bottle, with a little benzole, whereby it receives a milky colour; then add the other parts of benzole, and filter through paper.

This mixture is poured over the plates like collodion, after which let them dry; then the sensitised tissue, under water, is to be brought in contact with the plate, and pressed on; afterwards developed.

The developed picture, in a wet condition, is to be pressed together with the above-mentioned rosin-paper, exactly as in the English process. When dry the picture springs off itself.

At the last meeting of the Pennsylvania Photographic Association Mr. Smith gave his formula for reducing the intensity of negatives. He uses a saturated solution of perchloride of iron, ten drops of which are added to an ounce of water. After being applied the negative is well washed and treated with hyposulphite of soda. It will be seen that there is a great degree of similarity between this formula and one which was published several years ago in this Journal.

From the *Photographic Times* we learn with regret of the death of Mr. S. W. Hall, who for several years was President of the Scovill Manufacturing Company, New York. Mr. Hall had attained to a ripe old age.

We have already given an account of the large panoramic photograph, taken by Mr. Gutekunst, of the Centennial Exhibition Grounds, Philadelphia. The seven negatives for this were printed on a continuous sheet ten feet long by eighteen inches wide. We learn from the *Public Ledger* (Philadelphia) that a handsomely-mounted copy of this unique photograph was forwarded to the Queen by the hands of Col. Sanford, the British Centennial Commissioner; and that gentleman has forwarded to Mr. Gutekunst a letter from General Biddulph, the Queen's private secretary, with "Her Majesty's acceptance" of the picture, and her thanks to Mr. Gutekunst. The photograph is said to fully deserve this distinction, and Philadelphia may well be proud of it. It is placed in Windsor Castle.

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REMARKS ON STUDIO WORK.

[A communication to the West Riding of Yorkshire Photographic Society.]

In submitting the following remarks to your attention I trust you will excuse anything in them which may not be in accordance with your own views or theories.

We are all pretty well aware that our art is denied a place as one of the fine arts. May I ask, why is this so? Photographs can and are being daily produced which, for truthfulness, delicacy, posing, and lighting, far surpass many of the so-called works of art, with the exception that they are wanting in that great charm of all pictures, namely, colour. Photography in natural colours is of so complicated a nature that it must certainly be some years to come before it is made practicable, although I have a firm opinion that it will come to pass eventually.

But, apart from the want of colour, there is also another very great cause of our being denied admittance within the bar, and that is that the really artistic part of photography has been too much overlooked in the great desire to obtain clear, sharp photographs with plenty of definition—a quality to be admired in any picture when the adjunct, light, has been properly used. If that be neglected the results are far from satisfactory, being stiff and unnatural both in expression and lighting, and is a very just reason for refusing to recognise photographs to be considered as art-productions. Look at the works of our acknowledged leading men, and ask yourselves, are they made at random or mechanically? No; they are the results of care and experience combined with an artistic eye and taste. It is out of the question for any person to produce a good photograph unless he perfectly understands, and is capable of using and controlling, his light.

The subject of light and lighting pictures can never be exhausted; but, as a passing remark, I would advise all, when they see any work or photograph worthy of a place in their album as a study, to obtain it if possible, and do their best to produce results as good, or, if possible, better. There is no harm done in imitating a good thing, and it will in the future elevate our art to the front rank.

A school of photography, for the purpose of teaching and training, would, in my opinion, be a great step towards its ultimate recognition.

As to the chemical part of photography: whilst it is essential that everything should be in good order and harmonise with each other, this department is much more mechanical than the lighting of a picture. A properly-posed and lighted photograph is charming, even if the negative, chemically speaking, be not perfect; but when all are in unison we can look with satisfaction on the result of our labour.

There are so many good formulæ published that I think it would be out of place to particularise any of them; they are all, or nearly all, workable, and with care and attention give good results. If you think my own formulæ would be useful, here they are, although I must say that they are about the same as nearly all use.

Silver Bath.—Thirty grains in summer; thirty-five grains in winter—very slightly acid.

Developer.—	Protosulphate of iron	3 ounces.
	Glacial acetic acid	3 ,,
	Water	90 ,,
	Alcohol	3 to 4 ,,

If the developer require more than that quantity of alcohol to flow freely there is too much ether and alcohol in the silver bath, which should be boiled in order to evaporate it. I always keep a Winchester bottle of developer in hand to age slightly before use, as in practice I find it gives cleaner pictures without any loss of power.

Intensifier.—Pyrogallic acid for intensifying I have not used for a very long time, and can recommend the formula given by Mr. V. Blanchard three or four years ago as follows:—

Saturated solution of iron	2 ounces.
Glacial acetic acid	1 ounce.
Citric acid	½ ,,
Water	20 ounces.

to which add the requisite silver as required.

Use cyanide for *fixing*, as quicker and cleaner.

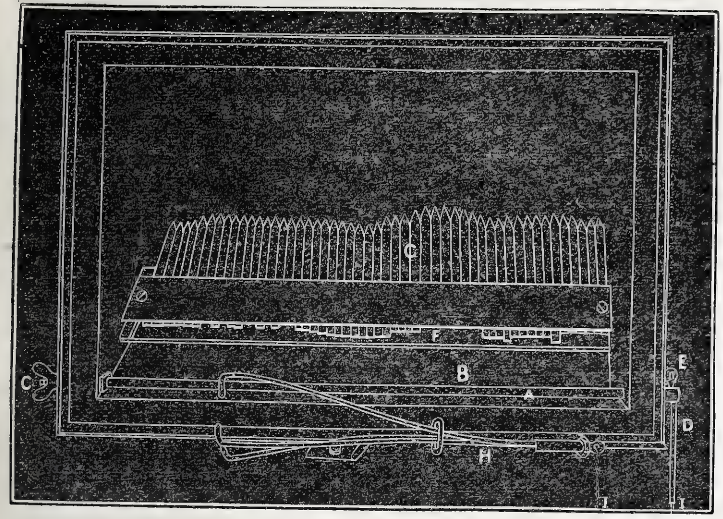
PRINTING PROCESSES.

There is just now an animated discussion going on about the relative value of the two printing processes—silver and carbon—for which I must refer you to the journals; but as a carbon worker I can fully endorse all that has been said in favour of that process, as to its simplicity, and also as to its commercial value. Whilst fully recognising the merits of silver printing I firmly believe that the sooner it gives place to its rival the better stand photography will be able to take in the arts—as permanency, without doubt, is a very great advantage, telling well with the public, and at the same time gaining both honour and profit. A. SACHS.

CAMERA SKY-SHUTTER.

As you recently drew attention to the means of shading the sky for securing clouds in landscape views, I thought the accompanying description and diagram of an apparatus I have constructed might be acceptable to your readers. Its recommendations, I consider, are threefold:—First, the edge of the shutter is readily adapted to any sky-line; second, the shutter, being removable, is easily fitted to the horizon line, as seen on the ground-glass screen, and fixed when put into position; third, the motion of the shutter about the horizon-line is made automatic, and with greater or less range of motion, as may be required, to soften the junction of sky and landscape. An additional advantage, at least to amateurs, is that it may be constructed by any mechanic from simple, homely materials.

The axis consists of a brass tube the same length as the width of the interior of the back body of the camera. As being convenient for my purpose I got a small-sized, plain, long "vesta-holder." This is a tube (*fig.* A in diagram) with a slit running from end to end.



A plate of zinc or tin (B), one inch wide, and as long as the width of the camera, is fitted into the slit in the tube after the latter is in its place, and may be secured by cementing or soldering.

Into each end of the tube is soldered a piece of brass wire, to pass out through a hole on each side respectively of the camera body near its base, and a short distance in front of the focussing-screen. On the left-hand projecting end (viewing the camera from behind) is fixed a winged nut (C). On the right-hand end is fitted a short piece of stout brass rod, perforated to slip on to the projecting wire. This perforated block, or cylinder, has attached to it, at right angles, underneath and near its outer end, another brass wire three inches long, having an eye at its lower end. This is the pendulum rod (D). Through the upper thickness of the block, or cylinder, is tapped a small thumb-screw (E), for tightening it on to the shutter-rod.

The shutter proper consists of two thin pieces of dry wood the width of the interior of the camera, forming a frame (F) to carry a series of vertical square rods of wood (G).

When about to begin the labour of ploughing-out such pieces, it occurred to me that ordinary square wooden matches might serve my purpose. Thanks to Bryant and May, a farthing box supplied what I wanted. By selecting the more perfect ones, levelling and smoothing them down on a true surface, and pointing the upper ends, I have a capital screen, light-tight enough when blackened over. To complete it, I had but to fix a small block at each end of the wider slip of wood, the same thickness as the matches, pack them into the recess side by side, bridge them over with the other slip of wood, screw it down through the end blocks, and the frame was complete. It only remained to attach the shutter frame to the metal plate. This I have done by cutting a short slit in the upper edge of the plate near each end, putting it and the frame together in proper position, and screwing two screws into the front of the frame at the bottom of the slit. By this means the frame can readily be "shipped" and "unshipped."

To save the necessity of carrying about a pendulum weight, I have made a clip (H) formed of three pieces of small brass wire, divergent at their lower ends, and terminating in hooks, with a running ring of metal outside them, by sliding down which the hooks converge and hold anything put into their jaws. For this purpose a stone could usually be found (one of three or four ounces in weight being sufficient) if the photographer has no suitable article in his kit. A piece of twine, attached at one end to the eye of the pendulum rod, and at the other to the eye of the clip, completes the pendulum. The extent of swing is, of course, governed by the length of the string; about twenty-four inches seems to be sufficient.

To use the apparatus proceed thus:—The view having been selected and focussed, put the pendulum rod loosely on the right hand projecting wire; slip up, and detach, the shutter-frame from its plate; take it outside the focussing-screen, and adjust to the sky-line by shifting the wooden bars up or down. Put it back in its place on the plate, shut the focussing-screen, and with the left hand, by means of the winged nut, raise the shutter to its proper level; tighten the thumb-screw on the pendulum block, and now the weight keeps the shutter in position, as set. When the plate is in, set the pendulum swinging, and the shutter rocks in proportion. The intended time for the landscape portion having been given, loose the pendulum thumb-screw; the shutter drops, the sky gets its amount of exposure, the lens is capped, and the view is taken. If the axis tube be fixed not quite parallel with the focussing-screen the motion of the shutter will be slightly diagonal, and there will be no chance of an image of the teeth upon the sensitive plate. G. S. PENNY.

P.S.—I see by the ALMANAC, which did not come under my notice till after my shutter was made, that Mr. Ayres and myself have independently hit upon the same mode of constructing the shutter, the principle of which was proposed and published long ago, though I do not remember to whom it is due. I make no claim to the original invention, and I presume Mr. Ayres does not, but only to a ready adaptation of it to practical purposes.—G. S. P.

ON THINGS IN GENERAL.

THE event of the month has been the discussion on the silver bath, with its usual accompaniments of facts from earnest experimentalists, and fancies, not to say figments, from those who may feel bound to say something though they may know nothing. I cannot see very much new light thrown on the subject, though the virtues of baryta have been more prominently shown than ever. These periodical airings and clearing up and general renovating of old ideas—so strikingly reminding one of the domestic disease yclept "spring fever"—are of great general utility, not the least being the incidental light it throws upon the newest mode of working, and the prominence it gives to the latest improvement of formulæ. Thus, in a paper read before the first society in the kingdom, I learnt how a gentleman "proposed in 1876," and that there were even "earlier suggestions to the same effect," to use two or more baths in succession to overcome the disturbances introduced by the first immersion. It was, further, very gratifying to find that the learned composer of the paper had no valid objection to the plan. How very glad all first-class photographers must be to hear this, for I apprehend there is not one who has not had the method in regular use for the last half-dozen years or more!

But the gravity with which we are told that a recommendation current since the earliest days of photography, which the oldest of us must almost have taken in with his photographic milk, and the serious way with which this is labelled "1876," is positively delightful! "Save us from our friends!" could never be more appropriately uttered than at this, if we were to look upon it as a puff of a certain work. But when, a little later on in the paper, we are informed that the same work contains "exact details" of a method of clearing a pinholey bath by treating it with cyanide of potassium, I cannot but think it is carrying the joke too far. Details in 1876, indeed! Who is there that does not remember the literary roasting Mr. Tully got, ten or fifteen years ago, for proposing this very method, and relating its success in his hands?

I should suggest to the writer of the paper in question to get hold of a copy of THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC of a dozen years ago; he will there find information of a more modern character.

As I write of all these new processes there comes into my mind sundry hints and paragraphs that I have lately seen relative to some new chemical process by which depth of focus is to be secured—something very like editorial sanction being given to the rumour. The Editors of this respected Journal are, as an American would say, "bosses" in optics, and it is rather like running one's head against a stone wall to try to controvert any utterance of theirs; but I don't believe any chemical process under the sun can alter depth of focus (so called) one iota. There! I've said it! I presume the advertisement sheet will let us know all in good time. There is evidently another *parturient montes*, which will, doubtless, be followed by the usual *ridiculus mus*.

I found myself, the other day, in a well-known photographer's studio. I saw lying about one of the most extraordinary little pamphlets it has ever been my lot to peruse. Scotellari's violet glass was to do wonders; but what will my readers say to the following bill of fare (which is simply the title-page of this little *brochure*)? Who will report on the photographic effect of this wonderful discovery? But, not to keep my readers in suspense, here is the title, which I do not scruple to copy into these pages, from the close affinity that lies between photography and blue glass:—

> "Blue glass. Something about Gen. Pleasonton's blue-glass experiments. The wonderful effect of associated lights upon animal and vegetable life. Bulls and heifers developed to full maturity in a few months. Grape vines grow forty-five feet in a year, and bear prolifically in eighteen months. Sick people cured of long-seated diseases by sitting under blue glass. Neuralgia, rheumatism, disease of the lungs, &c., cured. The heads of the bald made to blossom like a rose, so to speak. A great blessing conferred upon the human family without cost."

The American photographic journals are having their laugh out of it. I thought it too good to be lost here.

There is altogether of late an unusual amount of hard hitting in the correspondence columns, many in the process fever having arrived at the critical stage. What, I should like to know, too, is the meaning of the muttered hints about falsely-held medals—indeed, "hints" is scarcely the word, when it is boldly declared that one man exhibits another man's medals? I have heard of a man with a pewter medal getting a duplicate in silver at his own expense; but when a man deliberately gives his name and address, and states that in his own town this and worse is done, I think it behoves us all, for the dignity of our profession, to "see to it."

I have not seen the new child of literature—an American journal (the *Practical Photographer*)—quoted so much immediately after its birth. The elegance of its language is about on a par with the clearness of its metaphors. I cull the following two choice examples to illustrate their peculiar excellencies:—"Trying with the might of a ninny to stop its growth [*i.e.*, carbon printing], throwing frozen water, as it were, on and around its wheels of progress, till its maw is stuffed." I defy anyone to show me anything to surpass this. "The maw of the wheel of progress!" The editor's classical attainments may be gathered from my second extract:—"A sort of invulnerable Ajax armed at all points *cap-à-pie.*" Imagine arming the invulnerable and, above all, mythological hero in a suit (say) of chain armour!

But the battle of the carbonists is waxing hot. Heroes of every calibre rush to the fray, affording to outsiders no lack of interest. The patent question is governed by the same old ethics as ever it was, and the question is pertinently asked—"Where is the photographer who will sink his hundreds to save a five-pound note, and risk, in the possible event of ultimate victory, the effect of clearing the ground free of expense for the whole fraternity, and possibly for a keen rival.

There is a great deal of apparent candour among the body of "licensees," who make a great point of their secrets; but I am at a loss to understand the *raison d'être* of a letter professing to give hints, yet concluding after two columns of I-don't-know-why's with the following sage utterance:—"I have some other ideas on trial with regard to chromotype printing to be given to licensees only in their special organ. Carbon printing is now a commercial question, and outsiders are not to expect gratis what others obtain by purchase and experiment." This feeling was happily not that which has actuated the bulk of photographic experimentalists; but, as far as I can see, the licensees would prevent any one discovering on his own account. Thus even Sir Thomas Parkyns says—"If 'H. W.' is *only* an autotype licensee he cannot be expected to *know* * * * the perfected process." However, to paraphrase Captain Abney's recent remark, we shall soon have enough and to spare of "this wretched" carbon "controversy." It really is marvellous what two different lights acknowledged facts may be seen in according to the mental condition of the spectator.

I am very glad to learn that "Fownes" is to be cut in two, and none too soon; it has grown abnormally obese. These defects are hit off well in a little book I once before quoted from—*Discursive Chemical Notes:*—

> "It strikes me 'tis a somewhat vicious trick
> (But who's in fault 'tis not for me to say)
> To make our manuals so fat and thick.
> Leaves will fall out tho' bound in every way;
> Read, for example, Fownes's last edition—
> In a few days he goes to perdition.
> Is there one who doth not remember *Brande*—
> That huge, green volume of two thousand pages—
> Called 'manual' (unfitted for the hand),
> And carried from its shelf by easy stages?
> Man must possess both mind and muscle strong
> To read that book or hold it up for long."

Dr. Nicol's mishap with the gas bag the other day reminds me of a similar collapse that occurred at an exhibition I recently went to see. The lecturer was introduced, the lights turned down, and the usual full moon shown, followed by utter darkness. Lights turned on again, and apologies. The tap of the oxygen bag, not fitting tight, having been sent to be repaired, the workman had bored a hole right through the plug, so that, though apparently turned off at the jet, the gas was escaping all the while through the bag tap. FREE LANCE.

FOREIGN NOTES AND NEWS.

DR. OTT ON CARBON PRINTING IN AMERICA AND GERMANY.

LAST summer there were loud complaints from carbon printers of the sensitive tissue becoming so dry as to be useless, and various remedies were vainly tried, such as the addition of glycerine to the chromium bath, damping the paper, &c., the last plan only making matters worse by causing the paper to crumple up. From a very long letter to Dr. Vogel upon the carbon process in America, written by Dr. Adolph Ott, we learn that one of the greatest difficulties with which transatlantic carbon printers have to contend is this same want of moisture in the atmosphere. He says that Herren Schwind and Krüger find that it can be at anyrate partially remedied by a very simple means, namely, keeping the paper for several days above a water reservoir, so that the moisture drawn upwards by the heat should reach it. The same firm also protect themselves against the running off of the gelatine in the summer time by an addition of ninety-five per cent. of alcohol to the sensitising bath in the proportion of from twenty-five to forty-five per cent. to the volume of the fluid.

With regard to the keeping qualities of the sensitised paper, which is usually not thought to keep more than about a week, and that the carbon film by that time becomes difficult of solution, Herr Krüger says that, though in the heat of summer this may be the case, in the colder season of the year sensitised paper may be kept for months without injury, and that the film only dissolves the more readily when one comes to develope it—so much so that Herr Krüger even prefers to work with such old paper.

Dr. Ott then goes on to say that, if he remembers rightly, MM. Braun and Co., of Dornach, also keep their tissue for a considerable time.

With regard to the reticulation of the film of developed pictures, Dr. Ott's experience leads him to attribute it to smallness of the adhesive power of the transfer paper, arising either from too little gelatine having been put into it at first, or in consequence of some chemical change in the gelatine, to which alum is always added, having lessened its adhesive capacity. This view he supports by the observation that the reticulated appearance is never found in freshly-gelatinised paper.

He also thinks that, as a rule, pictures made by single transfer are finer than those made by double transfer, so that wherever it is possible by means of gelatine negatives, &c., to avoid the double transfer he would do so. Caoutchouc paper, he finds, gives as good, if not better, results than waxed paper. The drying of the adhering papers should take place at as low a temperature as possible; heat causes folds in the paper. To produce powerful pictures a weak four-per-cent. chromium bath should be used, and the printing done in the sun. A less-sensitive paper is produced by weak baths, which, however, furnishes powerful prints; while concentrated baths, on the contrary, produce very sensitive paper, which furnishes less powerful prints. To produce very powerful prints he exceeds the proper time of exposure by about a third, and then developes with water of about 40° C. Instead of enamelling his prints with collodion he finds it simpler and easier to glaze the print transferred to paper (whether by single or double transfer) with a glazing varnish such as that sold for this purpose by M Braun, of Dornach.

His experiments have almost all been made with tissue furnished by the same firm, of which A_6 chocolate, A_7 violet, and A_8 purple, are the numbers best adapted for imitations of silver prints.

A_1 pure black, A_2 blue black, and A_3 reddish, for the multiplication and reproduction of engravings and drawings done by hand.

A_4 bistre sepia, and A_5 green bistre, for ordinary photographs and transparencies.

Dr. Ott is confident that the carbon prints he has seen in America are equal to any he has seen in Europe, and in support of his opinion he quotes the words of the learned von Liebeg:—"When the Yankees take up an European invention they generally bring it to greater perfection than the Europeans themselves."

Meetings of Societies.

MANCHESTER PHOTOGRAPHIC SOCIETY.

AN ordinary monthly meeting of this Society was held on Thursday evening, the 12th instant,—Mr. Thomas Heywood, Vice-President, in the chair.

After the minutes had been disposed of, Mr. G. T. Yorston, Mr. James Calvert, and Mr. Robert Banks were elected members of the Society.

Mr. M. Noton read a paper on *Oxygen-Producing Apparatus* [see page 184], and exhibited his new retort. A conversation followed, during which the only noteworthy statement was made by Mr. W. Chadwick, to the effect that he had found the substratum of manganese for his cakes (recommended at the last meeting) quite unnecessary, the cakes, after yielding their oxygen, being removed without difficulty.

Mr. D. Young exhibited some emulsion plates on which drying lines were visible.

The meeting, which was well attended, passed a vote of thanks to Mr. Noton, and was then adjourned.

EDINBURGH PHOTOGRAPHIC SOCIETY.

The second popular meeting of the session was held at Queen-street Hall, on Wednesday evening, the 11th inst., on which occasion a very large audience assembled to hear a lecture on Arctic exploration.

The rostrum, as usual, was occupied by Dr. John Nicol, who introduced the subject by answering four questions:—"What is the North Pole?" "Where is it?" "Why do people want to go to it?" and "What has hitherto prevented them?" Some amusement was created by the answer to the second question, which, the lecturer said, was more difficult than the others, the pole being, like all terrestrial things, subject to change—"here today and away tomorrow"—only the "today" and "tomorrow" included probably thousands on thousands of years. The fact of a twenty-feet seam of coal in which were to be seen leaf impressions having been found within five hundred miles of the pole, proved beyond doubt that a temperate climate had once prevailed there, and equally so, he thought, that at that period the pole had been in another place. Arctic exploration, from 1575 down to the expeditions of McClure and McClintock in 1853, was rapidly surveyed, and it was shown that till the latter date there had generally been a twofold object in view—the discovery of a north-west passage to India and to reach the pole; and that, although the main objects had up to that time eluded the grasp of the explorers, benefits had been conferred on both science and commerce of much greater value than anything likely to result from the finding of that which they went to seek. The various expeditions, from 1853 (when the discovery of the north-west passage left the pole as the principal object of interest) to 1875, were next briefly noticed, and the remainder of the lecture was devoted to the expedition under Captain Nares.

The lecture was illustrated by a series of transparencies from negatives taken during the cruise of the *Alert* and *Discovery*, and the pictures were exceedingly interesting, especially those depicting the manners and customs of the Eskimo and the grandeur of the shores of the palæocrystic sea.

The first outdoor meeting of the season of the above Society was held on Thursday, the 12th inst., the scene of operations being Cadzow Forest, near Hamilton. Special arrangements had been made with the Caledonian Railway Company. The party left the West Prince's-street Station at seven o'clock, and reached Hamilton at half-past nine. The early ride had whetted the appetite, and consequently full justice was done to a substantial breakfast which the landlord of the Commercial Hotel had been ordered by telegraph to have in readiness, and then the party drove off to the forest in high hopes of a successful day.

The first halt was made at Barncluith—a most romantic group of three houses, erected in 1583, which crown a bank rising in terraces to a height of 250 feet above the river Avon. The terraces are laid out in a quaint, picturesque fashion, and contain a number of fine specimens, if the adjective be at all admissible, of those absurdly-ludicrous trees cut and trimmed and trained into the form of vases, globes, and domestic utensils generally, in which some of our ancestors so much delighted. From the outside, however—especially in combination with an old well,—several fine combinations may be made. Here several plates were exposed and then the party entered the forest. The word "forest," however, hardly conveys a correct idea of the place as it now appears. It occupies some 1,500 acres, and in prehistoric times must have been really a dense forest of magnificent oaks, under which sheltered large numbers of fallow deer, and the ancient breed of the Caledonian ox, some of the descendants of which are still to be seen, and, especially the latter, are objects of interest to visitors from all parts of the country. The glory of the oaks, however, has long since departed, and all that remains are the, in most cases, hollow trunks of the largest, scattered here and there singly and in groups of two or three, many yards apart. But although generally hollow, and of an age prior to written history, there is sufficient vitality left to annually clothe with foliage the wide-spreading, though scraggy, branches which yet remain, and give to the scene a kind of weird grandeur as they link the present with the long-forgotten past. On the outskirts of the forest, and close to the river Avon, stands the ruin of Cadzow Castle—or, rather, all that remains of it—consisting principally of an ivy-covered keep towering 200 feet above the stream, which is here spanned by an ancient bridge, so that there is not only fine food for the camera but plenty of variety.

Fortunately the weather was all that could be desired—just sufficiently hazy to give the much valued aërial perspective to those who knew how to secure it; bright sunshine tempered with masses of white clouds; while there was hardly a breath of wind. The company were fortunate in having Mr. Annan, of Glasgow, whose private residence is in the vicinity of Hamilton, as guide, and under his charge the most picturesque places were selected without loss of time. The party soon broke up into groups, and every camera was at work.

In consequence of the picturesque richness of the ground work went on rapidly, and by four o'clock all the plates had been exposed, several groups successfully taken, and the members prepared to drive back to Hamilton. Of course, the usual comparing of notes took place, accompanied by the customary expressions of hopes and fears as to the results, incident to all dry-plate work, especially in the hands of those who can only indulge in an occasional day's outing now and then. It may be added that there were thirteen cameras in the field. There were in all one hundred plates exposed, for periods varying from a few seconds to forty minutes, and the processes represented included wet collodion, beer and albumen, uranium, gelatino-bromide, Liverpool, Warnerke's tissue, and ordinary emulsion under various modifications.

Returning to the Commercial Hotel, the company sat down to dinner at five o'clock, Mr. Panton, at the request of the President, taking the chair, and Mr. Muir officiating as croupier. A day in the field is generally an excellent preparation for the enjoyment of a good dinner. The present case was no exception to the rule, and mine host of the Commercial had reason to be satisfied with the appreciation of the really excellent provision he had made. On the removal of the cloth,

The Chairman said that he was glad the Secretary was not to trouble them with the transaction of any business. He thought they had much reason to congratulate themselves on the large turn-out at this the first outdoor meeting of the season, and hoped it might be taken as a favourable augury of those which were to follow. They had also reason to congratulate themselves on the very favourable state of the weather, more especially as it had been so very different during the previous week; but most of all had they reason to congratulate themselves on having the benefit of the experience of their friend, Mr. Annan, as the guide for the day. It had often been matter for complaint that professional photographers did not take sufficient interest in the operations of photographic societies; but certainly that could not be said of Mr. Annan. They all knew how much time and attention he had given as one of the judges at the late exhibition; some of them knew that only a week ago he had devoted a day in arranging for the present excursion; and now they had seen how quietly and efficiently he had aided them in the work of that day. He had, therefore, much pleasure in proposing a full bumper to Mr. Annan, in perfect certainty that it would be heartily responded to.

Mr. John Lessels, the President, then proposed the health of Mr. Panton, who, he said, had really been the prime mover and life of the excursion, and who really had carried through successfully the whole organisation. There were, he said, several officers already in the Society, but as they were about to remodel the rules it might be worth while considering whether they might not appoint a director of outdoor meetings, and, if so, he was quite certain that in that office Mr. Paton would be "the right man in the right place."

Several other toasts followed and the time past pleasantly till 8.30 p.m., when the train was rejoined for the return journey. Shortly before the train started, the Treasurer, noticing the imperfect way in which the saloon carriage was lighted, disappeared, and returning shortly after, showed his usual fertility of resources in contributing to the amusement by placing on the table several packs of cards, a bag of peas to be used as counters, and two candles placed in empty castor-oil bottles by way of substitutes for candlesticks. By this means the monotony of the journey was pleasantly beguiled, and Edinburgh was reached at ten o'clock. So ended one of the pleasantest of the many pleasant outdoor meetings that have been held in connection with the Society.

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WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.

The ordinary meeting of this Society was held at the Odd Fellows' Hall, Bradford, on Monday, the 9th inst., the meeting having been postponed a week later owing to the Easter holidays,—Mr. John Smith, the President, in the chair.

The minutes of the previous meeting having been read and confirmed, Messrs. Stansfield and Terry were elected members of the Society.

Mr. A. Sachs then read a paper entitled *Remarks on Studio Work*. [See page 186.]

Mr. E. Wormald was of opinion that, with regard to artistic feeling in photographs, some of the portraits by our best photographers were equally as good in light and shade as the works of some of our best pigmented artists.

The Chairman said there must always be some few photographers in advance of the rest, as, owing to the number of persons in the profession, many, perhaps, had entered without any previous preparation. It was impossible that all should be equally fitted for the position of, or qualified to be classed as, artists.

Mr. Garrett said that colour did not play a very important part in photography, and did not by any means constitute a work of art. He was of opinion that if the public gave the photographer more time and a better price he would then be better able to produce really artistic work.

Mr. E. Greaves remarked that it was a matter of great difficulty with the photographer to produce a different pose for (say) the twenty or thirty sitters he might have in one day—that is, with the time he had at his disposal. But there was one thing he thought the photographer should avoid as much as possible, and that was the copying of other artists' productions. He had remarked that some of our leading photographers had a sort of pose of their own—indeed, almost a pose peculiar to themselves.

Mr. Garrett said that at the Dublin exhibition the photographs were classed with the fine arts; but he thought that could, perhaps, be accounted for by the fact that the photographs were considerably in the majority, a large number of photographers having applied for space for their exhibits.

Mr. William Cooke observed that, in his opinion, the photographer and the artist were about equal; at the same time, however, he thought photographers had not done what they might in the way of posing.

Mr. Sachs said that the duty of every photographer should be to do his utmost to elevate his art—not merely by copying others, but by trying to excel in his own productions.

Mr. Cooke showed a few photographs lent by Mr. Dallmeyer, being the productions of Mr. A. Kareline, of Nijni-Novgorod, Russia, who obtained the gold medal at the Edinburgh exhibition. The pictures were generally admired by the members present.

Votes of thanks were then accorded to Mr. Sachs for his paper, and to Mr. Dallmeyer for his kindness in forwarding the photographs for exhibition. The meeting was then adjourned.

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BERLIN PHOTOGRAPHIC SOCIETY.

At a meeting of this Society, held on the 16th February, the chair was taken as usual by Dr. Vogel, who laid upon the table a number of a journal called the *Erfindings Rundschau*, or "Review of Inventions," containing the latest news respecting new inventions and discoveries, and at the same time advised that a copy should be taken regularly for the Society's library.

A paper by Mr. Gaffield, of Boston, criticising the use of violet glass for glazing glass houses, was then read.

The Chairman doubted whether violet glass would work better than white, because as a rule it was produced from a mixture of red and blue, which were far from having the same actinic power as the pure violet of the spectrum.

Herr Quidde thought that even the purest spectral violet could not have the same actinic power as white, because it was only one of the colours that go to compose white light; should a shorter exposure have actually been observed—though of that he was very doubtful—it might perhaps have been caused by the milder light transmitted by the violet allowing of the curtains being drawn further apart.

Herr Tiator showed a model of a printing-table invented by him. The table has a square flat top, which is divided by pieces of wood crossing each other at right angles into nine compartments, each of which holds a printing-frame. The table can be moved from place to place by means of a foot furnished with a castor, and the top of the table can be placed at any given inclination, so that the sunlight may always fall perpendicularly upon the frames by a hinge placed at one side of the table top and a screw at the opposite side. For the printing of vignettes a mask having tissue-paper stretched over it is placed upon the frame.

Herr Quidde thought such a thin, fragile material as tissue-paper could not be used with advantage in the open air, even though one had, like Herr Tiator, waterproof covers always at hand.

The Chairman remarked that ten years ago Herr Wothly used a similar, though somewhat simpler, printing-table; it had, however, come but little into general use.

Herr Schaarwächter said that when, with Herr Bräuning, of Hamburg, in 1869, he had worked with a similar table, which was covered with tissue-paper, and had, besides, an arrangement of clockwork to assist in drawing it into position, that table answered very well, but could only be used where the number of printing-frames in use was limited, as where a number of tables were necessary they would require an amount of room seldom at the printer's disposal.

Herr Grüne showed a number of the Washington official patent list, the half of which consisted of patent specifications illustrated by phototypes printed in an ordinary book-printing press in the photo-mechanical manner.

Herr Quidde took the opportunity of remarking that it seemed to him that in France, England, and America phototypography was much more largely used than in Germany. For instance: he possessed an almanac, by Grévin, containing a great number of humorous illustrations which, from the accompanying text, he learned were produced by a photo-mechanical process. How cheaply those things could be got up was proved by the fact that the whole almanac only cost fivepence.

Herr Grüne mentioned a singular instance in which a photo-mechanical process had been used. Amongst the Turks the Koran must always be written—never printed; but to overcome the tediousness of writing by hand a way was sought of imitating writing which, being an exact and direct reproduction of manuscript, should evade the prohibition against printing, and for that purpose heliography was chosen, and an edition for Mussulmans was accordingly printed by Frühwirth, of London.

The Chairman exhibited a specimen of carbon tissue made by M. Braun, of Dornach, and two prints upon the same.

Herr Schüler praised M. Braun's carbon tissue.

Herr Liebmann inquired whether some glazed spots in the prints shown were to be laid to the charge of the tissue.

Herr Schüler explained that they were caused by the caoutchouc paper and not by the tissue.

Herr Schaarwächter exhibited two cabinet pictures showing the effects of the two American backgrounds, by Seavey, which were exhibited at the previous meeting. The effect was excellent—the shadows and dark places which appeared so strong in the original not coming out nearly so violently as was expected.

Herr Reichard showed a background painted by Herr Klieppel, of Berlin, from those of Mr. Seavey, which almost came up to the originals. He (Herr Reichard) pointed out how convenient it was to have some one in the same town who could paint such backgrounds, as it allowed photographers to give personal directions for them, and to see what modifications were required to suit the particular glass house for which the backgrounds were intended.

Herr Prümm thought it was a step forward in the right direction, but he hoped he would be excused for pointing out that there seemed to be rather too much drawing in Herr Klieppel's background, and that the lights and shadows were not so powerful as in those of Mr. Seavey, nor were they put in with the same freedom.

Herr Reichard said that Herr Klieppel himself was conscious of that fault, but when once the background was painted it was difficult to alter it.

Herr Hartmann agreed with Herr Prümm in wishing the drawing to be less decided, especially in the cast shadows, which would at present indicate a picture taken in the direct sunlight. As to the plastic effect of the background he could not yet give an opinion, as so much depended upon the lighting, and a background which produced fine effects in one glass house might give quite different effects in another. Should the lights and shadows of the background require to be strengthened, he thought it would be advisable to make the alterations when the background was in the studio and position where it was to be used.

Herr Fechner exhibited an album full of Japanese landscapes taken on the islands of Nipon and Kiasa by the Japanese photographer, Utzida, of Tokio; and Herr Linde showed some of Herr Remelé's African views and Herr Scholz's studies of animals.

The Chairman showed some of Goupil's photo-engravings, being reproductions of oil paintings, and gave a description of the process by which they were produced, which it is unnecessary to give at length here.

Herr Quidde regretted that so few details of the process were known, but, amongst other guesses made, he supposed the texture was got by sand.

Herr Schaarwächter reminded them of some of Goupil's photo-engravings he had shown them some time ago.

The Chairman thought the pictures referred to were not so beautiful as those then before them, and he asked Herr Jacobi whether similar pictures could not be produced by matt lichtdrucks upon glass, the texture being produced by an admixture of sand with the gelatine film.

Herr Jacobi said that by increasing the proportion of the chromium salt used such a grain could be produced without sand.

Upon the recommendation of the Chairman it was agreed to purchase the pictures then before them for the Society.

Herr Liebmann hoped that they would soon be able to furnish ornamented, ground glass slides for carbon transparencies in Berlin. An attempt to produce them by sand-blast had been set agoing, and promised good results.

Herr Schüler confirmed this, and said that in the sand-blast room at Messerknecht's the experiment was in "full swing," and they were trying to prepare a finer sand in order to give the ground glass a finer surface. He hoped to have something to show at the next meeting. To produce the required pattern an impression in carbon should be transferred to the slide to be ground, so that the sand might only attack the transparent places where the glass was uncovered.

Herr Grüne said that at a previous meeting, when speaking of the process, he expressed himself so that one might suppose he referred to a picture in half-tones. That would be an error, as only line drawings —or, at least, drawings in black and white—were usable. It would be extremely difficult to produce half-tones by the sand-blast. The difficulty was not surmounted by the use of different sorts of sand; therefore those slides had a certain monotony.

Herr Reichard explained that the sand-blast grinding he had seen issued from Messerknecht's establishment was not yet fine enough for carbon transparencies.

Herr Prümm said that glass prepared at Berlin by grinding was suitable for the purpose, but that, compared with the Parisian, it was too dear.

Dr. Weissenborn had tried to arrange with six Bohemian glass manufactories for a supply of glass for the preparation of window pictures, but had not been successful.

Herr Grüne remarked that, when etching, a good deal depended upon the quality of the glass as well as upon that of the etching medium.

Dr. Weissenborn said that Herr Geldmacher had written to tell him that he then possessed a solar camera which he believed to be the largest in existence, the condenser having a diameter of thirty-nine and a-half inches.

In the question-box a member asked for information as to the best mountant for lichtdrucks, and paste was recommended for the purpose. On this question being answered the meeting was adjourned.

VIENNA PHOTOGRAPHIC SOCIETY.

A meeting of this Society was held on the 6th ult., when the President, Dr. Hornig, occupied the chair as usual.

The President having called attention to the presence of Baron von Burg, who had come to thank them personally for the congratulations sent him on his eightieth birthday, the members rose to greet their venerable guest.

A number of new members were then admitted, amongst whom was the Prince of Hohenlohe-Schillingsfürst.

The President then laid on the table the rules of the recently-constituted Photographic Association of Breslau, and intimated that the Thüringian Photographic Society had a meeting at Jena, at which it was resolved to change the name of the Association to the "German Photographic Society," with head-quarters at Weimar. In connection with the meeting at Jena there was a very interesting exhibition of photographic apparatus, which was visited by numbers of persons, amongst whom were many of the professors at the University.

A letter from Herr Haakman, the President of the Photographic Society of Amsterdam, was then read, in which Herr Haakman said he had been disgusted to find that in the forthcoming exhibition of art and industry photography was to be considered as an art applied to trade merely, but that the Photographic Society of Amsterdam were desirous of organising a display in which photography would be shown to be an art as far removed from a mere mechanical use of cameras, paper, &c., as painting was from that of canvas, paints, and brushes, for which end they invited the co-operation of all other photographic societies.

Dr. Von Schwarz-Senborn called attention to Professor Kühne's experiments with the retina, and to Mr. Gaffield's (of Boston) experiments with the action of light upon various sorts of glass.

Several new pamphlets were laid on the table, amongst which were Davanne's *Les Progrés de la Photographie* and The British Journal Photographic Almanac.

A *genre* picture of a peasant girl standing at a cottage door, by Mr. Kurtz, of New York, was then handed round.

Herr Luckhardt remarked that the picture combined a Robinson combination print with a background painted in on the plate, so that a master hand must have been at work in the engraving of the copper plate as well as in the placing of the high lights.

To the question whether anyone had experimented with the violet lighting of a portrait either by means of glass or curtains,

Herr Luckhardt replied that the first experiment could only be made when M. Scotellari's violet varnish had arrived from Paris.

With this remark the proeedings terminated.

Correspondence.

TILTING THE CAMERA.

To the Editors.

Gentlemen,—Your correspondent "Syntax," in referring to swinging camera fronts, in your Journal of 30th March, says:—

> "It matters little whether you swing the front or back so long as you follow the looking-glass principle, and retain the axis of the lens in the centre of the curve, in which case only the upper and lower portions of the focussing-glass are affected as respects distance from the lens; but the case is different when the hinge at the bottom of the front becomes the centre of the curve, for then the whole surface of the screen becomes affected, no portion of it retaining its original distance from the lens, and the result is not satisfactory."

Now I must beg leave to differ from "Syntax." In the first case, *every portion of the focussing-glass*, excepting the infinitesimal line forming the axis, *is* affected; and in the latter case this line is simply transferred to the bottom of the glass. The angle will be precisely alike whichever be the plan adopted.

I mention this fact simply because it may be the means of preventing some persons from incurring the expense of having their cameras altered, and then finding that they have gained nothing whatever by so doing. I need scarcely say you must not in either case focus until you have placed the camera-front at the right angle and raised the lens to its proper height.—I am, yours, &c., Baynham Jones.

Cheltenham, April 12, 1877.

MATT VARNISH.

To the Editors.

Gentlemen,—In reply to your correspondent, "W. H. F.," respecting matt varnish: the sample that I used was made by Parsons, of Leicester. It was thinned down to give a thin coating. I found very little difficulty in getting an even coating. If you remember I showed you a piece of glass so coated, and you expressed your opinion that it was very well suited for the backing of transparencies.

I have also used with success collodion saturated with white wax. I think the French use something of this description. I have also used gelatine dissolved in skim milk, which answers the purpose admirably.

I intend making several other experiments in this direction, and will let you know the result. I must not, however, omit to state that I have tried collodion with a few drops of (a pale) negative varnish added, but always found it gave a nasty lemon-yellow colour by transmitted light (I have seen this mentioned in one or the other of the photographic journals), and could do nothing with it.—I am, yours, &c.,

Reigate, Surrey, April 14, 1877. William Brooks.

THE HYDROSULPHITE DEVELOPER.

To the Editors.

Gentlemen,—I have been preparing for a trial with the hydrosulphite developer, and have procured some bisulphite of soda from Mottershead's, of Manchester. I find that I cannot possibly dissolve one ounce in two and a-half ounces of water, nor, in fact, in double the quantity. Is there anything wrong here? Would it suffice to use a *saturated* solution to pour upon the zinc? I may observe that I found the salt strongly acid with SO_2, and had to add some carbonate of soda to neutralise.

In your number of the Journal of March 30th there was a misprint in M. Sammann's letter, to which it is well to call your attention, should you not have already perceived it. In one of his formulæ you put hypo*sulphite* of soda for hypo*phosphite*, which, of course, makes a serious difference. It is true the context corrects the mistake, but in a hurry some one might, perhaps, not observe this.—I am, yours, &c.,

April 18, 1877. W. H. F.

[There appears to be a very great difference in the nature of different samples of bisulphite of soda. One sample we have, and with which most of our own experiments have been made, is in fine, large crystals, and is very soluble. The strength given in our instructions is practically, though not exactly, a saturated solution. A different sample, obtained from a well-known London house, is entirely devoid of crystalline appearance, and is in the form of coarse powder. It is much less soluble than the first-named, and smells strongly of free sulphurous acid; while the other, though faintly acid to test-paper, is wholly devoid of smell. For neutralising this excess of acid we now prefer to use a strong solution of caustic soda, obtained by boiling a saturated solution of the carbonate with hydrate of lime. We have no doubt a weaker solution of bisulphite than that recommended by M. Sammann would give good results. We are obliged to our correspondent for pointing out the typographical error in M. Sammann's letter; it escaped our notice until too late for correction.—Eds.]

WHAT IS THE COST OF PRODUCING CHROMOTYPES?

To the Editors.

Gentlemen,—Being constantly asked what is the cost of producing chromotypes, will you kindly allow me space in your valuable Journal to quote my experience for the benefit of photographers generally?

I will give the working of a band of tissue into *cartes de visite*, as the most easy for comparison. To produce twenty-one dozen or 252 *cartes*:—

One band of tissue	£0	7	0
One band of transfer-paper	0	2	6
Transfer collodion	0	2	6
Mounts	0	4	0
Wages of operator	0	10	0
Wages for spotting, mounting, &c.	0	5	0
	£1	11	0

I suppose the above to be about the average quantity that will be produced daily in an ordinary studio, and, I think, a very easy day's work for an operator.

At the above rate the cost of producing *cartes* in chromotype is only one shilling and sixpence per dozen; and if we allow the enormous amount of twenty-four per cent. for waste and mishaps they are still short of two shillings per dozen.

If any photographer will honestly compare this with the cost of silver printing, and consider the advanced price that he could easily obtain for chromotypes, I think he will have sufficient courage at least to inquire into the supposed mysteries of carbon printing.—I am, yours, &c., G. Higginson.

16, *Nevill-street, Southport, April* 17, 1877.

CARBON LICENSES.

To the Editors.

Gentlemen,—The personal tone of the Autotype Company I may safely leave them to enjoy. The letter of "A Veteran" shows internal evidence of being also written by them or from the house. For the purpose of this reply I assume this to be the case, and they are not likely to deny it.

I will now name a very simple and conclusive way to settle the dispute. Will you kindly collect a sample of purple Lambertype tissue, a sample of purple supplied to a fifth licensee, and a sample of purple tissue supplied "in the open market" and purchased from the Company or their agents, by some one who had no license at all?

Appoint some disinterested person to expose these all under one negative, lay them all down on one collodionised opal plate, develope all together, and lay a sheet of transfer paper on all, and then let them be at your office for the public to see, and for the Autotype Company to call, and point out, as of course they can (?), in a moment the different tissues. I know the result of this experiment, and so do Messrs. Sawyer and Bird.—I am, yours, &c., SAMUEL FRY.

Surbiton, April 17, 1877.

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ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

A Man of Kent.—The various Almanacs mentioned have long been out of print.

Nicol Williams.—Make a wet collodion transparency and transfer it to the canvas. This is the simplest method.

J. Andrew.—Apply nitric acid to the crevices of the ebonite, and after the silver has been dissolved away wash well, and show it to an experienced worker in india-rubber.

W. Harrison (Paris).—Yours, with the various enclosures, received, for which we tender our thanks. We hope to have an article on the process in our next.

Erratum.—In formula No. 1, in Professor Stebbing's communication of last week, an error has occurred. For "bromide of potassium, 40 grammes," *read* "·40"—that is, 40 *deci*grammes.

An Annoyed One.—Your letter has been received too late for insertion in this number. To simplify matters we shall forward it to the parties concerned, and shall probably publish it, with their reply, in our next issue.

Inquirer.—The specimens sent indicate that you are quite able to take negatives of a good class. An improvement would be effected if a darker background were employed. It would also be better to use a solution of pyrogallic acid for intensifying.

Amateur.—A *camera lucida* cannot be successfully used in photography. It is, however, a useful little piece of apparatus for travellers, as it enables them to make an accurate sketch of any scene or subject without much previous knowledge of drawing.

Bowscar.—A very small porportion of chrome alum added to gelatine suffices to render it insoluble. We are unable to inform you of the minimum quantity that confers insolubility, but it is safer to add too much than too little. No glycerine must be added.

F. Larkin.—We are not aware of any method by which a collodion positive on glass can be fitted neatly into a locket except by means of a pair of sharp cutting-pliers. But even with the aid of such a tool a certain amount of adroitness will be required, otherwise the edge will appear raw and jagged. If, however, the requisite degree of skill be imported into the operation the upper surface to which the picture is attached may be cut with nearly as much smoothness as if it were a paper print operated on by a sharp pair of scissors.

H. H.—We are not a little surprised that your bath has proved so intractable, because kaolin and the other substances you have tried *usually* effect the decolouration of nitrate of silver solutions that have become charged with organic matter. Try the following, and if do not prove a remedy we "give it up":—Add about five or six drops of ammonia to the bath, and, having stirred it well with a glass rod, add about six drops of a saturated solution of citric acid, which will produce a flocculent precipitate. The solution after this ought to be colourless.

G. Heath.—We regret to hear of the cracking of the films of your negatives; but if you displayed no greater amount of care in packing them than you have done in the case of the negative you have sent for our inspection, it is matter for surprise that the *films* only have cracked, for your negative reached us in a thousand pieces. Try the following remedy:—Having procured a nice, firm tuft of cotton, let it be charged with the finest lampblack, and then, with a whirling kind of motion, applied firmly to the cracked surface of the negative. Under this treatment the cracks will disappear as if by magic.

H. B. Berkeley.—The result mentioned in the early part of your letter must be due to some peculiarity in the bisulphite you employ; that salt, as we have noticed elsewhere, being very variable in its composition as obtained commercially. We find that upon using the pyro. and hydrosulphite solutions a pink colour is *invariably* developed, but it is a matter of great uncertainty what will be the ultimate change. Some hours after mixing, the solution varies in colour from a deep blood-red tinged with brown to a full brown, similar to ordinary alkaline pyro. See our remarks at page 183 of the present number.

J. W. B.—We are unable to say whether your printing bath is too strong or too weak, as you have not informed us what is the strength. Speaking in general terms, a weak bath is more conducive to fading than a strong one. Fuming the paper with ammonia will not cause fading. Prints may be washed quite well in an hour, provided proper precautions and care be taken. If the alcholic solution of soap be used with moderation it will not affect the permanence of the photographs. If you had enclosed some specimens of your work in both conditions—that is to say, both fresh and faded—we might have been able to indicate the cause of the fading.

Lens (Prestwich).—If we rightly understand your question, you wish to know what kind of lens to purchase that will take cabinet portraits in the studio, together with views of houses. To take the former any good cabinet lens may be had recourse to in the certainty of its answering the purpose, but such a lens will not be the most suitable for outdoor work. The front lens, if used by itself in a reversed position and with a stop in front, will answer for landscapes, but not so well for architectural subjects, in consequence of its tendency to distort. If you try the front lens of your present French quarter-plate combination in the manner described this fact will be made apparent.

J. D. Cooper (Colchester).—Our correspondent, writing on the subject of carbon printing, claims, on behalf of the public, all the discoveries which up to the time of Swan's patent were untrammelled with any *patent rights* (which he believes to be synonymous with "public wrongs"), and asserts his intention of using any or all of them. He is further of opinion that as the Autotype Company, sometime ago, made a public renunciation of their rights to royalties they would now experience much difficulties in rehabilitating themselves with regard to such rights.——There is not the least doubt that up to the time of Swan's patent the discoveries made in carbon printing and published to the world are now public property; but this freedom has always been fully recognised by the Autotype Company. Respecting "patent rights" being "public wrongs," is it seriously the opinion of our correspondent that a man has no property in his inventions, or that he has no right to receive protection for his brain labour? Respecting the Autotype Company's having made a public renunciation of their rights to royalties on the use of their patents: we have looked over their former advertisements, but have not found that any of their announcements respecting business terms are intended to be viewed prospectively.

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The Blue Glass Mania.—From the *Scientific American* we learn that the mania for endeavouring to effect cures of all kinds of disease by blue light is still epidemic in New York. It is now quite common to see frames of the "azure crystals" hanging within the windows of dwelling-houses, while on sunny days the invalid grandfather or other patient may be noticed basking in the ethereal rays—his countenance filled with hope, though streaked with blue.

Narrow Escape.—From the *Wells Journal* we learn that Mr. J. Webber, photograper, of that place, has had a narrow escape from death. It appears that one evening recently, shortly before eleven o'clock, Mr. Webber had occasion to go to a back room in which he had been working during the day, and upon raising the candle he carried in his hand to light the gas pendant a loud explosion took place. He was knocked down, and the window frame was blown a considerable distance into the garden; but, beyond this, little damage was done to the property. Mr. Webber is badly burnt on the head, face, and hand, and suffers much from the shock; but we are glad to learn that he is doing as well as can be expected, under skilful medical treatment. The cause of the explosion appears to have been the absence of water in the gas pendant, which had either been drawn down for use and so left, or slipped in the absence of Mr. Webber, and in this way gas escaped into the room.

Photography in Court.—On Monday last, the 16th inst., at the Marylebone Police Court, Edward Noakes, photographer's assistant, was charged with stealing a lens, the property of Mr. Boell, photographer, Edgeware-road, in March last. From the prosecutor's evidence it appeared that it was the prisoner's duty before closing the premises to remove the lenses from the cameras and lock them up in a place provided for that purpose, take the keys with him, and reopen the studio at nine o'clock the following morning. This had been going on for some time, but a week ago a lens value £4 was missed and the prisoner asked to account for it, when he denied all knowledge of it. On being afterwards repeatedly spoken to he persisted in his statement that he knew nothing of it. The prosecutor was at last induced to apply to the police, and the lens was found to have been pledged by a person answering the prisoner's description at a pawnbroker's in Lisson-grove. The prisoner was arrested in some new lodgings he had taken in Duke-street, Marylebone, since the robbery. The lens was produced in court and identified by the prosecutor. The prisoner pleaded guilty, and asked the magistrate to deal summarily with the case. Noakes was sentenced to three months' hard labour in the house of correction.

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METEOROLOGICAL REPORT.

Observations taken at 406, Strand, by J. H. Steward, Optician.

For two Weeks ending April 18, 1877.

These Observations are Taken at 8 a.m.

April.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks.
5	29·31	SW	45	48	53	42	Cloudy
6	29·48	SW	45	49	54	42	Cloudy
7	29·67	SW	46	49	56	40	Cloudy
9	29·54	SE	49	50	57	46	Dull
10	29·51	N	49	51	59	48	Cloudy
11	29·64	SW	49	51	—	46	Cloudy
12	30·06	SE	40	44	50	38	Cloudy
13	29·96	SE	43	46	56	41	Dull
14	30·10	E	46	48	55	45	Dull
16	29·75	E	39	45	48	43	Dull
17	29·66	E	38	40	47	38	Cloudy
18	29·60	NE	38	42	—	38	Dull

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 886. Vol. XXIV.—APRIL 27, 1877.

M. CHARDON'S NEW DRY PROCESS.

We published a fortnight since, in our Paris correspondence, a brief description of the process for which M. Chardon, a French amateur, has been awarded the prize of 1,000 francs, offered jointly by the Photographic Society of France and M. A. Liebert, of Paris, for the best and most reliable dry process for use in the field, the conditions of which competition were issued about twelve months ago. Since the publication of Professor Stebbing's communication we have, through the kindness of our old friend, Mr. W. Harrison, of Paris, one of the commission appointed to make the award, been supplied with more complete details, and also with some of the necessary materials for trying the process, and it gives us pleasure to lay before our readers as early as possible the fullest information concerning the new method, which is said to fulfil most completely the conditions of the award.

We may commence by informing our readers that M. Chardon claims nothing new, but that the process combines the results of several years' experiments with the latest improvements introduced by other workers in emulsion photography (for, of course, it is an emulsion process). This much may be gleaned from a perusal of the account already given; but we are by no means certain that M. Chardon has not taken a too modest view of the matter. Our own impression, after reading the outline of the process given by Professor Stebbing, was that it formed a combination of the best points in several other methods without presenting any specially novel features; but the more complete details contain at least one novelty in connection with washed emulsion which will, in all probability, be found to form the keystone of the process. This, however, we shall notice in due course. As yet we have not had sufficient time to test the emulsion in its entirety, but have made the necessary preparations, the preliminary emulsion being still in the sensitising stage; meanwhile we shall give the latest formulæ and make what remarks appear to be necessary thereon.

Our readers will be aware that the competitors for the prize were required to deposit their formulæ and materials with the commission some months ago, and the following particulars embody certain improvements made by M. Chardon subsequent to that time. We prefer to give the formula as supplied to us, and shall afterwards speak of our own adaptation of it to English weights and measures:—

Collodion Bromuré.

Alcohol at 40°	33 c.c.
Double bromide of cadmium and ammonium (anhydrous)	1 gramme.
Bromide of zinc (dried)	1 ,,
Coton precipité (resistant)	0·5 ,,
,, ,, (pulverulent)	2 grammes.
Ether	67 c.c.

This formula, it will be seen, differs only from the one previously given in the quantity of cotton; but it will also be noticed that M. Chardon makes use of two descriptions, both of which are prepared by precipitation, after the manner proposed by M. Adolphe Martin. The first mentioned and distinguished as "*resistant*" is prepared with mixed acids, and is precipitated from its solution in ether and alcohol by pouring it into *hot* water. The second or "*pulverulent*" is made with sulphuric acid and nitrate of potash, and precipitated in cold water. As might be supposed from the difference in the mode of preparation as well as the names given to distinguish them the two samples vary very considerably in character. The sample of *coton resistant* supplied to us is in large, distinct tufts or "flocks" of considerable toughness and elasticity, while the *pulverulent* is in much smaller particles, which are easily reduced to powder. In point of solubility the difference is even greater, as M. Chardon permits the use of either cotton alone, the first-named being used at a strength of *one* per cent., and the other at *six* per cent., or about *five* and *twenty-nine* grains per ounce respectively. Practically, we found in dissolving twelve grains of the one and forty-eight of the other, in separate mixtures of ether one ounce, alcohol half-an-ounce, it was scarcely possible to distinguish one from the other by their fluidity; and in spite of the extraordinary strength of the latter (thirty-two grains to the ounce) it would have been quite easy to obtain an even film with it upon a tolerably large plate.

We dwell thus minutely upon the subject of the cotton because we think that it is this which forms the chief peculiarity of the process, and from which it will be found to derive its principal advantages. So far as we remember it has never been previously recommended to employ precipitated pyroxyline for the purposes of washed emulsion, and certainly it appears a rather roundabout and expensive proceeding to waste a still further quantity of solvents unless some great advantage accrue therefrom; but, if it be beneficial, trouble and expense, we opine, will have to form secondary considerations. That a beneficial result will be forthcoming we are quite prepared to believe, though we know it to have been the opinion of at least two well-known washed-emulsion workers that the pyroxyline would not stand a second precipitation.

We base our belief upon the following arguments:—The great fault of washed emulsions has hitherto been a want of body in the emulsion and of density in the resulting image, and this has been attributed—and rightly so, we think—to the fact that a portion of the pyroxyline is dissolved during the operation of washing the pellicle, and with it are removed the most valuable of the silver compounds. Now it is evident that if the more soluble portions of the pyroxyline be previously removed there will be less risk of loss during the washing of the sensitised pellicle. And, again: by the removal of all insoluble and useless matter from the pyroxyline we obtain from a given weight of the precipitated cotton a collodion of greater body combined with fluidity, and therefore more capable of holding the silver bromide in suspension and in a finer state of division. These views are corroborated, so far as the experiment has gone, by the behaviour of a sample of precipitated cotton prepared since the receipt of M. Chardon's formula from the ordinary plain collodion we employ in the preparation of washed emulsions. The pyroxyline used in its manufacture is soluble to the extent of ten or eleven grains to the ounce of solvents; but seven and a-half or eight grains is the maximum allowable for a fluid collodion. The precipitated cotton, on the contrary, gives a clear and tolerably fluent collodion when used in the proportion of *thirty* grains to the ounce of ether and alcohol in the proportion of two to one, and when used at half that strength will stand the addition of thirty grains of silver per ounce, dissolved in a few drops of water and half-an-ounce of alcohol, without the slightest trace of granularity in the silver bromide formed. It remains to be seen how this and M. Chardon's emulsion will bear the second precipitation.

We will now pass on to the bromides employed. The anhydrous double bromide of cadmium and ammonium does not exist in the laboratory of every amateur, and, so far as we are aware, is not obtainable commercially. It is, however, easily prepared by mixing the two bromides in their equivalent proportions, and fusing the mixture at a gentle heat in a porcelain capsule. The resulting double salt when cooled is in the form of a greyish-white enamel-like substance, which should be pulverised and kept in a well-stoppered bottle. It is easily soluble in alcohol, and *if* really anhydrous should have a combining equivalent of about 117. The zinc bromide we usually keep in alcoholic solution, as recommended by Mr. Warnerke, the combining value of the solution being formed by actual experiment. For the present purpose, however, the alcoholic solution was evaporated to dryness and the requisite quantity weighed out; but for very exact work this plan is not advisable, as, owing to the extremely deliquescent character of the salt, and the difficulty of getting it perfectly dry without decomposition, much uncertainty exists.

We will now give the actual formula employed by us, premising that, though we have not adhered to the precise quantities given by M. Chardon, the proportions of cotton and bromides are strictly adhered to, while the solvents are very slightly varied to make an even quantity. The formula is as follows:—

Alcohol	1¾	ounce.
Bromide of cadmium and ammonium	24	grains.
„ „ zinc	24	„
Pyroxyline (resistant)	12	„
„ (pulverulent)	48	„
Ether	3¼	ounces.

The two descriptions of pyroxyline were dissolved separately, as we have described previously, and the bromides were dissolved without difficulty in the remaining half-ounce of alcohol, so that it will be seen the double salt is abundantly soluble. The whole, when mixed, formed a perfectly clear collodion which required no filtering. This was sensitised with seventy-six grains of silver nitrate dissolved in half-a-drachm of water, to which was added, after solution, an ounce and a-quarter of alcohol. This was poured very gradually into the bromised collodion, and formed at once a rich brown orange-coloured emulsion, which after some hours has changed to a deep ruby. Poured upon glass it gives a rich-coloured but very transparent film, the transparency being due to the extraordinary freedom from granularity and structure, in which respect it resembles albumen.

The above quantity of silver exceeds that directed by M. Chardon by ·4 of a grain in the six ounces of emulsion, which is not of much importance, especially when it is borne in mind that the emulsion has yet to be corrected for free silver. As far as we can calculate from the rather doubtful combining equivalents of the bromides, we should judge the excess of silver to be somewhere between half-a-grain and one grain per ounce; but, provided the correction be duly performed, the exact excess is not of paramount importance. The formula for the chloride collodion to be used in neutralising the excess remains the same as given by Professor Stebbing, or, as we have adapted it to our own measures:—

Alcohol	1½	ounce.
Ether	1½	„
Cotton (resistant)	15	grains.
Chloride of cobalt	75	„

In view of the uncertainty which exists as to the exact value of the excess of silver, it is impossible to say precisely how much of this chlorised collodion it will be necessary to employ, but if our figures be correct a little more than one drachm will be required; this, however, must be found by testing.

By the aid of Professor Stebbing's information our readers will now be able to prepare the emulsion. Next week we shall be in a position to speak of the behaviour of the plates, and also to describe M. Chardon's method of development, which presents some novel features.

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MODIFIED MALT AND GELATINE PROCESS.

It is not quite impossible, although at the present time it appears to be in no slight degree improbable, that every photographer will make use of alcoholised gelatine emulsion as a substitute for collodion. It will be deduced from this remark that we are aware of *some* photographers having certainly attained to this stage of, if not progress, at least deviation from that conservatism in practice which has prevailed during so long a period.

A very powerful objection to the use of gelatine was urged several years ago in connection with the well-recognised fact of its decomposition; but not till December, 1873, was a remedy at once simple and efficient suggested for this drawback, when Mr. E. W. Foxlee, in a communication to this Journal, described the advantages that would accrue by the admixture of alcohol with the gelatine. Mr. Foxlee said:—"If alcohol were substituted for a large proportion of water in the gelatino-bromide emulsion the following advantages would result:—The gelatine would keep for an indefinite period without decomposition; the film would set much more rapidly, so as to admit of the plates being reared up on end to become desiccated; and, finally, owing to the volatility of the alcohol, this desiccation would take place in comparatively little time." Since Mr. Foxlee threw out these hints they have been acted upon with great success, and we have already in a previous article (*ante* page 37)—to which we desire this to be considered supplementary—as well as in a subsequent notice, alluded to the success attained by Mr. Wm. Gray, of Fraserburgh, when operating with an emulsion to which a certain degree of permanence has been imparted by means analogous, if not precisely similar, to those described.

Since we published the article to which allusion has been made we have continued our experiments in this direction, and find that certain modifications may be adopted with advantage.

One of the most recent and, probably, the most successful of the gelatine emulsions we have prepared was made as follows; but, previous to giving the details, we should state that, through the kindness of the Countess Ebersburgh, we obtained a sample of a new preparation of malt, the outcome of recent experiments by her distinguished relative, Baron Liebig. From some trials to which we subjected it, this preparation, which is now becoming rapidly known under the designation of "Liebig's Malted Food Extract," appeared, as a preservative or organifier for dried collodion plates, to be a substance which might be used with much advantage in conjunction with gelatine. Accordingly upon a dessert spoonful of this "extract," which is in the form of a coarse dark powder, we poured nearly half-a-pint of boiling water, and, after allowing it to stand until cold, with an occasional stirring up, filtered the fluid extract through muslin, and steeped in this a suitable quantity of Nelson's gelatine. We recollected that, in an interview with Mr. Gray, that gentleman informed us he had employed albumen in this manner, and found that it became altered in some way in consequence of its absorption into the gelatine, owing to which its property of being coagulated by hot water seemed to be suspended. But we had succeeded in a satisfactory manner when using Burton ale for a nearly similar purpose, as already described, and were desirous of testing the efficacy of malt as an organifier while in its primitive form, as well as when after its constituents had undergone the chemical change incident to fermentation.

After the gelatine had become swollen by being saturated with the malt extract it was exposed to a current of air to drive off a portion of the water, and then liquefied by heat, alcohol being *slowly* added to bring it up to the proper degree of fluidity. At this stage was added the nitrate of silver and soluble bromide, which, by decomposition, formed the bromide of silver. When these had been thoroughly incorporated by means of a spatula the mass was poured out into a flat vessel, and, when set, cold water applied to effect the removal of the crystallisable salts formed as the other result of the decomposition. We may here observe that we have tested the efficacy of this method against the ingenious and excellent method of dialysis proposed by Mr. J. King without discovering that the latter possesses any special advantage, except that of rendering it unnecessary to allow the gelatine to set in order to remove the nitrates.

We find that an alcoholised gelatine emulsion prepared in the manner described answers every purpose indicated by Mr. Foxlee. It will keep good for a long period without decomposition, and the film sets with great rapidity. If it is to be used *wet* it is only necessary to coat the plate as if collodion were employed, hold it level for a few seconds, gently drain the superfluous emulsion back into the bottle, and then again hold it level for a fraction of a minute, after which it will be found to bear being reared on end; and if immediately transferred to the dark slide for exposure while still wet it will be found to possess a degree of sensitiveness not inferior to that of wet collodion.

As we are continuing our experiments in this direction we shall again bring the subject under the notice of our readers—probably at no distant date.

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HARDNESS IN CARBON PRINTING.

Some time since we were experimenting in the direction of enlarging by carbon and obtaining prints by the same process, when we experienced a series of annoying failures difficult at first to account for, as the conditions under which we worked were apparently identical with those giving us results of an entirely satisfactory nature a day or two previously. We had, as we thought, produced an excellent enlarged negative; but on attempting to print from it the resulting print was far too hard and unsuited for the purpose we required it for. As, at the same time, we had another negative or two with tissue under them, all of which gave perfect impressions, we concluded we had been deceived as to the printing capacity of the negative, and at once took another in its place. This new one giving satisfactory prints we thought no more about the matter till quite recently we again met with a negative which gave results different from our expectations, the print from it being quite deficient in half-tone, and altogether of the soot-and-whitewash type.

Upon this occasion, however, we did not replace the negative without examination. We satisfied ourselves by inspection, and by printing a silver print, that the negative itself was faultless. It was now evident that the tissue was to blame, and we thereupon sensitised a fresh piece, the result of which also did not please us. Upon developing the picture it seemed to promise very well; but just at the moment the soluble part was washed off the more delicate shades and the half-tints seemed also to disappear, leaving the bare paper beneath. This print was upon rough Whatman's paper, and we thought it possible that it had not been coated with a sufficient body of gelatine; our next step, therefore, was to prepare some with a different surface.

Still the inexplicable washing away followed, and also occurred with the ordinary smooth single transfer-paper, thus satisfactorily proving that nothing but the tissue was concerned in the failure. Our next step was to sensitise five different pieces of tissue, giving respectively twenty seconds, forty seconds, one minute, two minutes, and three minutes, as we preferred to believe it was the manner of treatment and not the tissue that was in fault. We thought we had solved the riddle now, for the two and three minutes' sensitising gave us detail and delicacy almost to excess.

But, again another negative failed; no amount of variation in the time of immersion made any difference in the result. Determined to thoroughly elucidate the matter, we examined all the negatives which had turned out so unsatisfactory in printing to ascertain what special characteristic they possessed in common, and this we found at once to be *unusual density*. Carrying our experiments into this groove we discovered that tissue which, *with a negative of average density, gave perfect results produced with extra-dense negatives utterly worthless prints*, all the half-tone leaving at once, appearing almost to flake off in patches till the whole was removed, leaving nothing but the blacks and darker tones and bare paper. We considered this a discovery of some considerable importance, as, to the best of our recollection, no attention has hitherto been called to this fact in a positive manner. We are, of course, aware that stress has been laid upon different negatives requiring different treatment, but the particular result we name is now first pointed out, and its remedy we shall proceed to indicate.

These dense negatives, it is to be understood, were not themselves wanting in gradation. Printed in silver they were all that could be desired; but the longer printing they needed seemed to point to the production of some peculiarity not hitherto remarked in the solubility of the "insoluble" part, which seemed to have a connection with the relative time required between the half-tints and the blacks rather than the absolute time taken up by the exposure; for a weaker negative placed in a less powerful light, so as to take the same time to print, gave all the detail and gradation the negative contained. The whole circumstances point to a simultaneous connection between distant points in the same piece of tissue, of which, at present, we do not care to hazard an explanation.

Let the cause of the defect be what it might, it was evident that in rendering the tissue less soluble lay the secret of successfully encountering the difficulty, and the first experiment we made with this aim was crowned with success, and was as simple as efficient. It consisted simply in keeping the tissue some time after sensitising before printing. The time necessary will naturally vary according to the heat of the atmosphere and its hygrometric condition; but at the present season it will be found that two days' keeping will answer all purposes. We have repeated the experiment on different occasions, and found the simple expedient named to answer admirably when a piece of the newly-sensitised was useless.

We now find no difficulty in accounting for the discrepancy among the recommendations of various printers regarding the type of negative most desirable for carbon printing. One has recommended very weak negatives, a second has stated that no change whatever is needed in the character of negatives taken for carbon printing, and yet a third has ascribed his success to the using of sufficiently dense negatives. It will be remembered that a well-known photographer, who has given the public the benefit of his experiences in carbon printing, laid great stress upon the desirability and, in fact, the actual need of having extra-thin negatives to obtain the greatest amount of gradation. But he, after a short time, came round to the opinion that any negative would do; the variation in the character of the tissues we name, when happening without its cause being known, would be quite sufficient to account for these and other contrary recommendations. And here we leave the subject for the present, after having, as we believe, elucidated the cause of a capital defect in carbon printing.

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THE BARYTA BATH AND ALUM DEVELOPER.

Since Mr. Henderson published his article on the above subject he has received numerous letters referring to the matter. One o these he regards in a somewhat representative light, and requests us to publish it, together with his reply, which he believes will be useful to others. We suppress the name of the correspondent:—

"I take the liberty of troubling you for a little information respecting your baryta bath. The following is my experience :—I made a bath of sixty ounces as follows :—

Nitrate of silver	5 ounces,
,, baryta	180 grains,
Water	60 ounces,
Iodide of potassium	40 grains,

slightly acid.

Now this produced fine results for a few days. The exposure was half what was required for the ordinary bath, the only difficulty being in the negative intensifying rather slowly, especially if over-exposed. I found the nearer the exact time in exposure the brighter was the negative. The developer was as follows :—

Saturated solution of ammonio-sulphate of iron	2 ounces.
Glacial acetic acid	8 drachms.
Water	18 ounces.
Methylated spirits	½ ounce.

After washing about four days my troubles commenced in the shape of a mealiness in the film. It seemed as if the whole deposit on the negative was composed of very minute particles which, when magnified, represented almost imperceptible pinholes all over the film. I tried filtering, which sometimes remedied it a little, fresh collodion (generally one-half old and one-half new—Mawson's), and entirely new collodion. The only difference I found was that when new collodion was used the particles were much finer. The prints from these negatives were very soft but not vigorous, the difficulty being to get them dense enough. I then boiled the bath dry and made it up again to the ordinary strength—thirty-five grains—but just adding the baryta, not iodide of potassium. This again commenced by working well, but again, about four days afterwards, indicating mealiness. After filtering next day it increased; I tried more acid in the bath, but had to give it up. Now I would like to overcome this. I think a new bath ought to work well for a longer period than this. The weather is not over fine here, and business not brisk, and I am afraid if we were as busy as we are further on in the summer it would not last more than two days.

"Do you find this bath last as long as the ordinary one and take as little looking after? I experience no difficulty whatever with the old baths, and have often worked them down to under fifteen grains with good results. If you can recommend a remedy for the fault I shall be much obliged, and furnish me with answers to the following:—How long does your bath last before it requires anything doing to it? What is the method you adopt in strengthening it? and how long do you generally work it? Where can I find the experience of Mr. Black, of America, referred to in your article in the Almanac for 1876? I hope you will favour me with answers."

In reply to the above Mr. Henderson says that his correspondent's bath is too strong; it should not register over thirty-two grains to the ounce, *including* the baryta. There is no reason why it should get out of order, as he (Mr. Henderson) has used a similar bath for several years without its requiring to be "doctored." He suggests the use of a developer composed as follows:—

Protosulphate of iron	20 grains.
Common alum	40 „
Acetic acid	20 minims.
Water	1 ounce.
Camphor	to saturation.

If the above give a picture that is too hard, a softer picture can be obtained by reducing the proportion of the iron without increasing the exposure.

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"PHOTOGRAPHIC APPARATUS."

We are as well aware of the indefiniteness of the title to this article as any of our readers can possibly be; but, definite or otherwise, it is precisely that which we find affixed to the specification of a patent applied for on the 28th of August last, and which has only recently been published. In the publication of patents our Patent Office does not by any means hurry itself; for long experience has shown us that what would be a matter of minutes, or at most hours, in the printing-office of this Journal, becomes one of weeks or months when it becomes involved in the meshes of what Dickens so aptly designated our "circumlocution" office.

On the above date a patent was applied for in connection with an "invention" the nature of which we prefer that our readers shall discover from the official record, which is couched in the following terms:—

This invention consists in certain improvements in the arrangement of photographic lenses, whereby pictures in stereoscopic or natural relief are obtained.

According to this invention this relief is obtained by employing lenses of larger diameter with a short focus, the margin of the lens forming a parallax corresponding to the distance between the human eyes, the diaphragm or stop being so placed as not to cut off the marginal rays. The diameter of the lenses employed must not be more than four inches or less than two inches, and the back focus (not the equivalent focus) must not be less than one or more than three diameters of the front lens. Any form of lens or combination of lenses may be employed for the purposes of this invention as above described, except that known as the ordinary portrait lens, which from its limited field and want of penetration is quite unsuitable.

We confess our utter inability to discover what the patentee is "driving at." If he intend that the method indicated shall supersede the use of the now time-honoured binocular camera it will not be difficult for us to show wherein it is manifestly inferior, inasmuch as in respect of cost the single lens of four inches diameter will, if carefully made, cost ten times more than the two single lenses hitherto found to be quite sufficient to satisfy the requirements of the photographer interested in stereoscopic work. But, waiving the question of cost, we inquire by what means a single, or even compound, lens of four inches, employed with a stop preventing all but the marginal portions from acting, can be made to be serviceable in photography. If a diaphragm with a small aperture were placed tolerably close up to the right margin of a large lens, and a picture then taken, a second picture on a different plate being taken when the same diaphragm was placed close to the left margin of the lens, then these two pictures would, when combined in the stereoscope, yield what is known as a stereoscopic effect. But this effect would have been obtained under such circumstances of displacement of the diaphragm, no matter what the nature of the lens was, that a stereoscopic image would be secured whether a lens were employed or not.

If the patentee intend that, by taking one picture by means of both margins of the lens excluding the action of the centre he will obtain a picture having stereoscopic relief, we have merely to observe that the superposition of two images obtained from different points of view upon one sheet of paper will give simply a jumbled, confused effect which will not be tolerated by one who examines a picture. Let it be well understood that an effect of solidity can only be produced in the brain of the observer, and that by no kind of drawing or superposition of lines can a true stereoscopic effect be obtained.

Why a portrait combination is set aside in the patented method we know not; but we can affirm most positively that the same rule applying to a single lens (if such a lens as that indicated in the patent *could* be obtained) will apply with equal force to a portrait combination. "Want of penetration" depends not upon the form of the lens but upon its angular aperture, by which we mean the relation between acting aperture and focus.

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PHOTO-MEZZOTINTS.

We are at length in a position to give the full text of the specification of the patent obtained by Messrs. Brown and Barnes, of Liverpool, for the method of producing mezzotint effects which, last year, formed the subject of not a few communications. It is as follows:—

This invention has for its object the production of an effect or mezzotint effect in photographic portraiture, and is more particularly applicable to the style known as the vignette, although it is capable of being applied to other styles.

It has heretofore been the practice in photographic portraiture to leave the surrounding margin of the picture plain and without pattern, except so far as such pattern has been confined to a regular oval, dome, or other shaped margin surrounding the subject, and so far as an artistic effect could be produced by after manipulation by abrading the surface and by the use of pigments and colour.

Now in this invention the groundwork blends in with and harmonises with the figure, producing at the same time an effect of softness and atmospheric relief direct in the process of printing, such atmospheric effect having only heretofore been produced by hand painting, or by a process known as the Vanderweyde process, in which process powdered gritty substances, pigments, and colours are used to obtain such effect, and by artistic manipulation and the use of pastil.

In carrying out this invention the stippled granular effect is produced direct in the process of printing the photograph, and is attained by making one or more negatives from a suitable groundwork of leather, paper, cloth, or other suitable material, the surface of which groundwork is raised, impressed, embossed, or reticulated with a degree of coarseness or fineness to suit the taste of the operator.

Further: from such reticulated negative a print is taken; then such print is treated by the artist with crayon or pastil so as to produce an effect according to taste. From this prepared print a second negative is taken, such negative bearing the reticulated surface and also the artistic manipulation.

The process is—having printed the vignette or other photograph in the manner ordinarily adopted by practical operators, we cut from one print so obtained a mask, which we place on a negative of the embossed or reticulated surface, or an embossed or reticulated surface combined with the artistically-produced surface before mentioned, fastening down only the lighter and inner outlines of the photograph, and at the same time curling or turning over in a graduated manner the outer vignetted portion of the figure, and this prepared negative and mask we then place on the vignetted photograph as ordinarily produced, the operation being carefully conducted in the dark room that the sensitive surface may not become affected by exposure to daylight until the above-named arrangement is completed. We then place this combination of negative and mask and print on a revolving table or disc, and submit the whole arrangement to a moderate amount of daylight, keeping the said revolving table or disc slowly in motion until the reticulated pattern, or the reticulated pattern and artistic background, becomes sufficiently blended in with and printed on the vignetted picture; keeping in motion may be performed in any suitable manner. The rest of the manipulation in the fixing and completing of the photograph is done in the manner usually adopted by operators.

In order to produce a more intense degree of atmospheric effect we are sometimes careful to prepare the negative of the reticulated surface so that the lower portion of the said negative may produce a print darker and more shaded than the upper part; but the absence of this precaution does not materially detract from the desired effect, but may be used at the discretion of the operator.

The particular points of our invention are—

1. The production of the reticulated or granular stippled surface surrounding or in combination with and blending with the figure.
2. The production of the reticulated or granular stippled surface and artistic background or surrounding in combination with and blending with the figure.

The following are directions such as will enable any practical photographic operator to carry out our invention, and produce what we term the "mezzotint vignette":—

The stippled granular effect is attained by tinting through a negative produced from a surface of morocco leather, or other surface having a suitable grain and colour, or by tinting through a negative produced from a print which has been taken from the first or reticulated negative and artistically treated by pastil, or by artistically working on any other suitable grained surface, and reproducing therefrom a printing or tinting negative.

In carrying out this invention various negatives can be kept in stock suitable for different sizes and descriptions of pictures to which they can be applied, according to the taste of the operator, thus saving the labour and time in not having to produce the artistic effect on each picture separately.

Having now fully described and ascertained the nature, object, and purposes of our invention, and shown how the same may be carried out into practical effect, what we claim as our invention and secured to us by letters patent as aforesaid is—

1. The production of articulated or granular stippled surface or surrounding in combination with and blending with the figure in photographic portraiture or other photographic production by means of a negative having a reticulated or granular surface, which has been produced from a material, such as morocco leather, the negative being applied during the printing process as hereinbefore described.
2. The production of a reticulated or granular stippled surface and an artistic background or surrounding in combination with and blending with the figure in photographic portraiture or other photographic production by means of a negative which is produced from a print, which print is taken from a negative having a reticulated or granular surface, and afterwards artistically manipulated by pastil, such negative being applied during the printing process as hereinbefore described.
3. The production of a reticulated or granular stippled surface and an artistic background or surrounding in combination with and blending with the figure in photographic portraiture or other photographic production, by artistically working on any suitable grained surface and reproducing therefrom a printing or tinting negative, such negative being applied during the printing process as hereinbefore described.

Richard Brown.
Robert William Barnes.

From the claims thus definitely made our readers will see the precise nature of what has been patented by Messrs. Brown and Barnes.

From the recent discussion of the silver bath and the troubles connected therewith it appears to be now generally accepted as a fact that the most fruitful source of pinholes is sulphate and not iodonitrate of silver, as was formerly believed; at anyrate, it is clearly proved that the former salt does, under certain circumstances, conduce to the production of that form of evil, while it is not by any means certain that the latter is blameless. The question, however, arises as to how the sulphate of silver is formed in the bath during ordinary use, and the only available solution is that sulphuric acid or sulphates are introduced into the bath as impurities either in the silver itself or in the collodion. Granted that such is the case, it is still not altogether clear what reaction takes place between the substances so introduced and the silver nitrate, unless indeed the sulphate exist already formed as an impurity in the latter; for sulphate of silver is not readily formed by double decomposition with any of the other sulphates likely to find their way into the bath, nor is free sulphuric acid under ordinary conditions calculated to bring about such a change. A peculiarity in the behaviour of sulphuric acid with silver nitrate, under certain circumstances which we do not remember to have seen noticed previously, may, however, throw some light upon the matter. If these two substances be brought into contact with one another in aqueous solution no effect is apparent, unless the solution be a very concentrated one and the temperature considerably raised. If, however, sulphuric acid be dropped into a comparatively weak alcoholic solution of silver nitrate a copious deposit of crystals of sulphate ensues. Now this effect is open to one of two explanations: either the alcohol acts catalytically in bringing about the decomposition of the nitrate by the new acid or, more probably, the difference is due to the insolubility of the silver sulphate in alcohol, whence it arises that, as soon as formed, it is precipitated. This view is strengthened by the fact that crystals of the sulphate are formed in concentrated solutions which, owing to their easy saturation, deposit the crystals that in a weaker solution would remain dissolved. The crystals are precipitated with even greater readiness from a solution in ether and alcohol mixed, as may be seen by adding a few drops of the acid to collodion saturated with nitrate of silver. We can thus imagine that if sulphate of silver be formed in the bath it may be held in solution until the latter becomes sufficiently charged with ether and alcohol to cause its deposition, and the surface of a newly-introduced plate offers the most likely resting-place for the deposited crystals, owing to the solution in its immediate vicinity being more highly charged by the rapid diffusion of the solvents contained in the film. In addition, we can understand how the ether and alcohol in a well-used bath may possibly act as an inducing cause in bringing about the formation of the silver sulphate in the first place.

RETICULATION IN CARBON PRINTING.

The cause of reticulation in carbon tissue has been generally assumed to be quickness in drying; but against this it has been said—and I have myself seen an instance of it—that a quickly-dried tissue may produce prints without any trace of the dreaded defect.

I believe the real condition under which tissue will be found to give reticulation is when the gelatine passes from a liquid state into the dry state; and, on the other hand, that reticulation does not occur when the gelatine passes from the jellied condition into the dry state.

Of course, heat will favour the first condition, and this is no doubt the reason that quick drying has been supposed to cause reticulation; but if the tissue be well squeegeed, and the quickness of drying be caused by draught or dryness of the atmosphere, I believe that no reticulation will take place.

With the same temperature some varieties of gelatine will jellify, while others, especially if partly converted into metagelatine, will become liquid. The amount of liquid taken up from the sensitising bath will also influence the required amount of heat for liquefaction to take place.

W. E. Debenham.

THE PROCESS OF SELECTION.

Referring to an article in a recent number on processes as represented in the late Edinburgh exhibition, and especially to the unexpectedly meagre display of emulsion work notwithstanding all that has been said and written on the subject, I think that at the present season, when, in anticipation of the summer campaign, apparatus is being overhauled and methods of working decided on, a few words of advice, the result of practical experience, may prove useful to the less experienced of my readers, and to those who care less for experiment than for securing good results in the limited time they can give to the practice of the art. "Where to go with the camera?" is not now so much the question as what to present to the "eye" of the camera when you get there; and my object in the present article is to afford some little assistance in the settlement of that question.

I may say, at the outset, that for amateurs of limited leisure, whether as regards beauty of results, simplicity in manipulation, and certainty, *an* emulsion process is to be preferred. *Which* of all the various modifications that have been from time to time recommended is, of course, a different matter, but one upon which a little consideration will perhaps throw some light. I suppose it must be taken for granted that "in the multitude of counsellors there is wisdom;" but it is not so easy to sift the wheat from the chaff, and, while eliminating the useless, combine all the really valuable, suggestions that have been made. From the introduction of the process by Messrs. Sayce and Bolton down to the present time there has probably been more written on emulsions than on any other photographic process, or perhaps on all other processes together; and yet I think that the result of the whole may be divided into two classes—that with a bromide in excess, and that with an excess of silver in the first instance, converted into some other salt of silver before its application to the plate. I do not, of course, mean to assert that no emulsion has been worked in which free silver nitrate did not exist, but simply that I have examined many hundreds of samples from as many different sources, and never yet succeeded in detecting a trace of it. Neither do I wish to undervalue any of the suggestions that have been made for the improvement of the process; as, in point of fact, I may say that having carefully tried almost every one I have succeeded in doing good work with all, although not by any means with the same ease or with the same satisfaction.

What I aim at now is to answer such a question as the following, which has recently been put before me more than once:—"I have dabbled in photography a great deal with more or less satisfactory results, but am now resolved to go in for something like systematic landscape work. So far as I can see the emulsion is the process likely to suit my requirements best, but having spent the leisure hours of the winter in studying nearly all that has been written regarding it I am still at a loss as to the modification that would suit me best. I do not care for excessive rapidity, although I should like the introduction occasionally of a figure or two into my pictures. I want plates that will keep well both before and after exposure, that will develope easily with a simple alkaline solution of pyrogallic acid, and that will acquire under its action sufficient density without further trouble. Amongst the recommendations I see bromide in excess, bromide and silver in such proportions as to mutually decompose each other, silver in excess in various proportions, with the addition of acids singly and combined, and with chlorides and nitrates of various metals, not to speak of an almost inexhaustible series of organic matters. As is but natural, the fathers of such varied offspring claim for each a superiority over all the rest; but it is quite clear that all cannot be best, and therefore I want you to say what, from your experience, you think best for me."

To this modest request I reply without hesitation—discard all complications, or leave them to more experienced operators, and use the process as nearly as possible as originally introduced. The formulæ have been published before, but it may be useful to do so again. The collodion should contain in each ounce six grains of bromide of cadmium and three grains of bromide of ammonium, and be sensitised with thirteen grains of nitrate of silver. This should be shaken occasionally for two or three days and then examined, when it will be found to contain a trace of free silver nitrate. A measured drachm of the emulsion should then be placed in a test tube, and sufficient water added to throw down the pyroxyline and bromide of silver, when the whole is to be poured on a filter and washed to remove the free silver. To this liquid an alcoholic solution of bromide of cadmium of known strength should be added till the whole of the silver is converted into bromide; and in this way, by a little calculation, the quantity required to convert the whole of the silver nitrate in the emulsion into bromide may be readily ascertained. This and sufficient more should be added to give about one-twentieth of a grain of free bromide in each ounce, and then the emulsion will be ready for use and keep good for weeks.

That plates prepared with such an emulsion will keep is amply proved by the fact that I have recently exposed and developed several that were prepared in the early part of 1874, and they are, apparently, as good as when they were made. As to keeping after exposure: I, some time ago, developed a batch that had been for over three months in America, and had been taken from New York to California and back, one or two at a time having been exposed during that period. It is true that not more than one-half of these plates turned out printable negatives; but that arose, not from any fault in the plates, but from other causes. Of course, under ordinary circumstances I advise that the plates should be developed as soon as convenient after exposure, but most certainly a few days, or even weeks, may elapse without deterioration.

John Nicol, Ph.D.

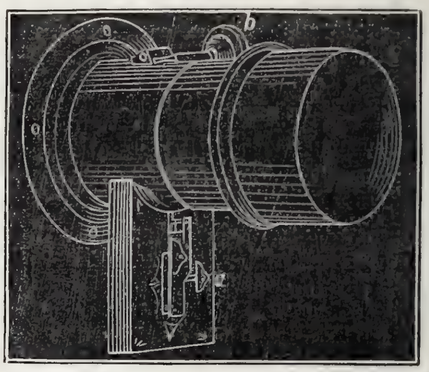
FOREIGN NOTES AND NEWS.

A Decoration Bestowed upon a Photographer.—Herr Wehl on a New Method of Shortening the Exposure for Portraits by After-Lighting.—Polygraphic Exhibition at Nürnberg.—A Glass Box for Clearing-off Old Negatives by Acid.

We learn from the *Frankfurter Zeitung* that the King of Wurtemburg has testified his appreciation of the recently-published book *On Light in the Service of Scientific Research* by conferring on the author, Dr. Stein, of Frankfort, a knight's cross of the first class of the order of Friedrich.

According to the *Marburger Zeitung* the Emperor of Austria is so pleased with some equestrian portraits taken for him by Herr H. Krappek, of Marburg, that he has sent him a breastpin set with brilliants. A similar jewel has, according to *Il Popolo Romano*, been presented by the King of Italy to Herr Zinsler, a photographer in Rome.

Herr Wehl, of Mainz, has been considering how an ordinary exposure may be shortened by the mechanical means already at our disposal, and, pending the discovery of a chemical means of arriving at this desirable end, as the result of a long series of experiments he has come to the conclusion that the exposure may be materially shortened by what he calls "after-lighting;" but the meaning he attaches to this word is not that which has already been technically associated with it. By after-lighting a picture in the usual way the drawing of the picture is inevitably injured, or at least the balance between the lights and shadows is disturbed, as the sitter or object being removed the after-lighting light acts equally upon the whole of the picture. Now by after-lighting Herr Wehl means an exposure without the diaphragm, and without the sitter having moved, which shall immediately follow and shall last an aliquot part of the time of the original exposure with the diaphragm. By this means, he says, not only can the exposure be considerably shortened, but the resulting picture will have gained in softness and the light and shade will be more harmoniously blended. Thus an exposure of twenty seconds may be easily reduced to twelve or fifteen seconds, and yet it might be supposed that the shortest exposure had been the longest, did one not know to the contrary by exposing nine or ten seconds with the diaphragm, and then exposing three seconds more either without the diaphragm or with one having a larger opening. The greatest difficulty connected with this proceeding is that of changing or removing the diaphragm without shaking the objective or distracting the attention of the sitter. In order to obviate this Herr Wehl has had a little contrivance attached to the lens mount by touching a spring in which the desired change is effected. In the accompanying illustration (*a*) is one of these springs.



In general the proportion to be maintained between the exposure with the diaphragm to that without it is as three of the former to one of the latter; but the proportion of the after-lighting decreases in proportion as a longer exposure, thus:—In an exposure of thirty-five minutes the first exposure would be thirty-two minutes and the after-lighting three minutes; while with an exposure of nine seconds the first exposure would be seven seconds and the supplementary exposure two seconds. The proper duration must be learnt by experience, as it thus varies from a quarter to a sixth; but Herr Wehl has worked out the following examples:—

The ordinary exposure was	Which could be reduced by exposing		To a total of
	With Diaphragm.	Without or with larger opening in Diaphragm.	
15 seconds	7 seconds	2 seconds = one-third	9 seconds
42 ,,	18 ,,	6 ,, = one-third	24 ,,
1 minute 12 ,,	28 ,,	7 ,, = one-fifth	35 ,,
2 minutes 24 ,,	50 ,,	10 ,, = one-sixth	1 minute
1 hour	32 minutes	3 minutes = one-eighth	35 minutes

This method has long been known, but till the present time it has not been so thoroughly systematised.

There will be what is called a polygraphic exhibition at Nürnberg this autumn, somewhat similar to, though, of course, on a much smaller scale than, the forthcoming Caxton celebration in this country. The object of the Nürnberg exhibition is to show the progress and development of printing and the graphic arts in Germany from the beginning of the sixteenth century down to the present day, All sorts of prints and printing-presses will be shown, including photo-mechanical presses; and it is expected that there will be a fine display of woodcuts, lithographs, etchings upon metal, glass, photographs, &c., &c.

To lessen the manual labour required when large numbers of glass plates which have been already used are to be cleaned, Herr Luckhardt recommends that a number of them should be enclosed in a box with acid for some time. As, of course, an ordinary wooden plate-box with grooved sides would be destroyed by the acid, Herr Luckhardt has had one made of cast or moulded glass with grooved sides, in which he places a batch of plates. As each glass box or chest only holds one size of plate he finds that an ordinary studio would require three—one for each size of plate used most frequently.

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PHOTOGRAPHY IN COLOURS.*

Wet Process.—The collodion that I employ for the three heliochromic negatives is a collodion with bromide alone, containing four per cent. of bromide of cadmium and five to seven decigrammes of cotton. As to the silver bath it is twenty per cent., and the development of the kind called alkaline. Three solutions, viz.:—

Solution A.

Distilled water	1 litre.
Pyrogallic acid	5 grammes.

Solution B.

Distilled water	1 litre.
Bromide of potassium	50 grammes.

Solution C.

Distilled water	950 centimetres cube.
Liquid ammonia	50 „ „

These three solutions kept separately must only be mixed at the time of using. The solution A should be prepared a short time before using, for it will keep only a few days. The proportions to observe in mixing the three solutions may vary according to the temperature, the model, the degree of strength that is desired for the *clichés*, &c.; the discernment of the operator should be exercised on a knowledge of these two things, viz., that the bromide of potassium prevents fogging, keeps the limpidity of the lights of the negative, and that the ammonia gives intensity to the shadows. Nevertheless, as a point of departure, the following proportions may serve as a guide:—One hundred centimetres cube of solution A, twelve centimetres cube of solution B, and six to eight centimetres cube of solution C, as the case may be.

The solution C should be thrown into the developing glass the last of the three; they must be well mixed together with a glass rod and spread immediately on the glass.

Here are the special operations for each of the three negatives:—Negative with the green light to sensitise or to render sensitive to the green light that of the three plates which corresponds to the glass of that colour. I introduce into a special flask, containing the collodion mentioned, the substance known under the name of "aurine," or otherwise called "orange coralline," soluble in alcohol and not in water; the proportion is two decigrammes of aurine for one hundred centimetres cube of collodion. The glass after sensitising in the above silver bath is washed in distilled water, then exposed wet in the camera. I then leave it a few minutes in a bath of alcohol to free it from the aurine, the presence of which would only be an incumbrance during the succeeding operations. After the aurine is washed out I immerse the glass for some minutes in a bath of pure water and proceed to the development. The exposure to the sun for this negative, the slowest of the three, will be from ten to fifteen seconds with a double lens; and with a landscape lens (triplet, aplanatic, globe lens, &c.), it varies from one minute to ten according to the opening of the lens and of the diaphragm employed.

The washing of the glass after sensitising should be done, as I have said, with distilled water, with the use of aurine in the collodion; the last residue of calcareous salt suffices to destroy the sensibility of the glass to the green light according to the proofs above stated.

In principle chemically-pure water is indispensable; there is, nevertheless a way of ultilising water for washing even if slightly calcareous. It consists in leaving a slight excess of nitrate of silver in the sensitive layer in place of completely washing it, to expose it to the light in that state, and not complete the washing with the imperfect water at hand till after the glass shall have received the action of the light. The development which follows the washing will bring out a suitable image.

The properties of aurine or orange coralline had been pointed out to me by a publication of Herr Vogel. I will point out in my turn the sandragon amongst the substances indicated by M. Chautard (in his treatise on the spectra of chlorophyle) as giving large rays in the green part of the spectra. I have notably experimented with the leaves of the red beetroot. The sensitive plate impregnated with an alcoholic solution of the said leaves, according to the method which will be hereafter described for using chlorophyle, has given me rapid impressions with the green light. This is only a first point ascertained; I should not dare to guarantee complete regularity of the results.

Eosine, originating from the laboratory of Professor Bayer, of Strasbourg, gives apparently to collodion the sensibility of the green rays.

Negative for the Orange Light.—To make the plate which corresponds to this glass sensitive to the light transmitted by the orange glass, I do not use either the collodion with aurine but with an alcoholic infusion of chlorophyle, the preparation of which will be described below, and I proceed in the manner following:—I collodionise and sensitise the plate with the collodion and the silver bath common to the three negatives. I wash it in distilled water to free it from the excess of nitrate of silver, then immerse it in a bath of rectified alcohol, so as to substitute this alcohol for the water which the layer has retained; and the better to ensure the penetration of this layer by the solution of chlorophyle I leave it a few minutes in the solution in question, which gives it a light-green tint. I drain it a few seconds only, and immerse it immediately in a bath of distilled water. I maintain it there long enough for the water to replace the alcohol in the layer of collodion. The layer will retain the chlorophyle, which is in effect insoluble in the water. The time of this last immersion is reduced to about a minute if care be taken to agitate the plate by the aid of a hook; once drained the plate is ready for exposure in the camera. The exposure will be about a quarter of that which the aurine plate requires.

I obtain by a very simple means the alcoholic solution of chlorophyle. I fill a flask with fresh-gathered leaves of the ivy cut into small pieces with scissors. I put in rectified alcohol 40°, so as to cover the ivy, and leave it to infuse. At the end of three or four days the beautiful green shade which the liquid assumes little by little will have acquired its intensity, and the solution will have arrived at its maximum photogenic power. It only requires then to be filtered through paper, and kept shaded from the light. It will keep good during fifteen days or a month, according to the season. At the end of this time it will change to a dirty yellowish-green, which is the indication that its properties are weakened. A glass thus prepared with chlorophyle is only good for the negative with the orange light. It is not for the negative with the green light; it is the red and orange rays which form upon it in more or less time their impression, notwithstanding the green medium interposed.

Negative of the Violet Light.—The collodion, the silver bath, and the developer are the same, as I have already said; as for the other two negatives, the only change consists in suppressing the aurine and the chlorophyle, and the operations with respect to them. The aurine would lengthen greatly the exposure. The exposure is scarcely more with interposed violet glass than if the operation was with white light.

The three sorts of plates of which I have made known the preparation may the one and the other be kept in the moist state several hours. It is sufficient to keep them in the last bath in which each of them is treated; therefore the first thing in the morning we may prepare the plates required during the day for taking landscapes or portraits after nature. It is a notable simplification in the practice of the wet method. If required for landscapes, they may be kept in grooved boxes for the place where the operations are required.

If the negatives once treated by the alkaline development and once fixed have not sufficient vigour, I give it them whilst they are still wet by reintensifying with pyrogallic acid and nitrate of silver. In the case where they are once dry, and they offer feeble differences of intensity, there is no inconvenience in equalising them by a light supplementary intensification.

To free the chlorophyle negative of a green tint which has been given to it, after it is dry I immerse it in a bath of ordinary alcohol; if wet at the moment of being submerged the layer will not be freed from the chlorophyle except with difficulty.

Of the three surfaces of which I have spoken there are two of a sensibility exceptional to the smallest photogenic rays; hence it is evident that the anti-photogenic coloured glass which is used for lighting the laboratory should be very deep shaded, and reduced to as small dimensions as possible. Besides, during the time the plates are in the baths, care should be taken to cover the dishes with a board or a sheet of cardboard.

To ensure during the whole course of the operations the solid adherence of the layers of collodion to the prepared plates, as described, it is sufficient to roughen the borders of the plates about a centimetre wide.

Chlorophyle being a reducer of salts of silver explains why I have not introduced it into the collodion itself, as I did the aurine. The contact of chlorophyle with the silver bath will give clouded proofs (fogged).

Dry Method.—The dry method gives the three negatives without the help of any accelerating substances, such as resin, rosin, aurine, chlorophyle—absolutely required in what relates to two of the negatives by the wet method. I have already said in effect that the dry plates, with a precaution relative to their washing, are by themselves sensitive to the green light and the orange light, as also to all the rays of the slightly refrangible portion of the spectrum. The details into which I have entered on this matter are sufficient for the employment of this method—more slow, but in certain cases more convenient, than the wet method. The bromide collodion, the bath of silver, and the alkaline developer, of which I have previously given the formulæ, may be used. The time of exposure may be shortened by making use of collodion prepared with that variety of gun-cotton called intense or powdery cotton.

(To be continued.)

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NOTES FROM NAPLES.

There are people who are always hungering after some new process; here is the description of one I found in an *old* newspaper:—

"New Photographic Process.—M. Muller, of Bolbec, a skilful chemist well versed in all photographic manipulations, has just discovered the following process for obtaining impressions by means of dry collodion:—1. Take 100 grammes of clear whites of eggs, beat them up into a stiff froth, and then add ninety centigrammes of distilled water and from ten to twelve drops of creosote; beat up the albumen again for three or four minutes, and then let it stand for eight or ten hours. Filter through a clean piece of fine linen, and keep in a phial provided with a ground glass stopper. 2. Boil together 250 grammes of honey, five of lampblack, and 100 of water for five or six minutes. While this mixture is on the fire, mix up the white of an egg with 100 grammes of water, and pour it into the boiling liquid; continue the ebullition for three or four minutes longer, then filter through paper, add twenty grammes of alcohol, and keep in a phial similar to the former. These two liquids will keep a long time. 3. A pane of glass being coated with collodion and rendered sensible as usual, wash it well with distilled water, and let it drip from one of its corners; this done, pour upon the said coating a mixture of twenty grammes of the first liquid and ten of the second. This mixture must be made at the moment it is wanted, and not prepared beforehand. Pour it on slowly, let it drip a little, then pour on a second portion, and leave it in its inclined position until dry."

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* Continued from page 164.

I have not tried it, as I prefer the emulsion process, than which nothing simpler can be found. When the formula for the zinc emulsion was first published I immediately tried it, and have found it very reliable. In the ALMANAC for this year I find an article on it by Mr. W. F. Henry, in which he describes a "wrinkle" in making the emulsion. I think he published it before, and I tried *it* also; but unfortunately the bottle in which I dissolved the silver cracked from the heat, as most bottles would do. This I was not aware of until I poured in the requisite quantity of bromised collodion and shook it up. The effect was somewhat like a soda-water bottle, for the bottom, instead of the cork, flew out, and the boiling emulsion with a fizz that startled and electrified me!

I was persevering enough to try a second, which did the same; only with this difference—that the bottom came off and went down the glass chimney of the lamp, carrying the silver with it. It dissolved in the petroleum, and, I daresay, if I had worked it out skilfully, would have resulted in a "new silver salt"—as good, perhaps, for making emulsions as another that was discovered some time ago. However that might be, I had had enough of Mr. Henry's "useful dodge," and I have not tried it since.

As I have had some little experience with this process, perhaps a few notes will be interesting. Among the first negatives I took with this zinc emulsion was one of the entrance to the Catacombs—a rather difficult subject presenting great contrasts. The sun was shining brightly on the white rock above the entrance and on a wall beside it, and the Catacombs were dark, of course. Exposing for the shadows, I expected to get the lights very thin from over-exposure; and on developing these came out so apparently. After intensifying and fixing I found the negative quite transparent, but of the colour that albumen gives. In printing it took a couple of hours in the sun, and the print was very hard. I now seldom intensify; but it is necessary to use the strong carbonate of ammonia developer, for the weak one (with liq. am.) gives no density. The emulsion keeps for about a month; after that it begins to fog a little if the developer be kept long on the film.

I have found Mr. Brooks's method of obtaining density very good on refractory emulsion plates. After exposure I flood the plate with the following:—

Alcohol	1 ounce,
Ale	1 ,,
Tannin	10 grains,

then wash as little as possible and apply the developer.

In experimenting with emulsions the bottles must be often cleaned to receive a new sample; the best way of doing this is to pour a little liquor ammonia into the bottle, shake it, and rinse out with water. Sulphuric acid may be substituted for the ammonia, but not nitric acid.

I have been often bothered by non-emulsification; it is the result of using alcohol and ether that are of too low grade for dissolving the cotton. Again: in dissolving the silver in the little water that must be used, on adding the alcohol the liquid separates into two strata that will not unite; the saturated, heavy solution will not "dissolve" in the light alcohol. It is better te mix the water with the alcohol before putting in the silver, and so prevent any inconvenience.

A NEAPOLITAN PHOTOGRAPHER.

SCIENTIFIC JOTTINGS.

WE have on a previous occasion alluded to the aid expected to be obtained from photography in the cause of astronomy, the question of the existence of a small planet lying between Mercury and the Sun having assumed great interest lately. Certain observations made at various times within the century having given cause for supposing that such a planet did exist, M. Leverrier has calculated from them as near as can be the date when it should reappear and appear to travel across the sun's disc. He, therefore, issued a circular to various astronomers, asking them on March 21, 22, and 23 to keep a strict look out upon the face of the sun, so as to detect any strange or unusual spot. The great difficulty lies in the fact that the planet would appear very little different from any of the many spots with which the sun is always so well marked. Here it was that photography was expected to aid; a series of photographs taken every few minutes would reveal not only any fresh spot, but also, if the exposure had been systematically timed, its path and rate of progress. M. Leverrier's recommendations have been well seconded, our Astronomer-Royal having telegraphed to various observatories and observers in the colonies for a strict watch to be kept, and in many cases we learn photography was to be made use of. So far, however, as can be learnt, from information already published, the trouble has been in vain, no indication having been observed regarding the new heavenly body.

We continue periodically to see in the various scientific serials accounts of further experimental research into the principles of the radiometer, but all tend to show an almost universal consensus of opinion that it is to the kinetic action of the residual air that we must ascribe the motion of the vanes. Some imperfect reports of experiments made and described before the Philosophical Club by Sir W. Grove having appeared in the foreign journals, an abstract has been made of the two reports he sent in. Those of our readers who wish to follow up the subject may see the abstract in *Nature* for March 15.

As bearing on the leading article upon water, in our issue for the 23rd ult., we may note a letter by Professor Wanklyn, published in the *Chemical News*, in which he states that water which is not pure changes in its chemical character very rapidly—so much so, that he recommends, in his well-known work on *Water Analysis*, that any sample to be tested should be kept in a cool and dark place, and examined, if possible, within forty-eight hours after the collection of the sample. May not this reveal possibilities in connection with fogging baths?

The action of water in the shape of superheated steam upon iron seems likely to become of utility to photographers for their metal work. We recently, in our *Jottings*, alluded to a chemical process for producing an unchangeable film of iron oxide upon the surface of any article composed of iron. The new method, recently discovered by Professor Bartle, consists in exposing the red hot metallic surfaces to superheated steam, the effect being to produce a coating of magnetic oxide of iron, which, unlike ordinary "rust," is quite permanent and adheres closely to the surface it is produced upon. Its action in this respect is analogous to that of oxide of zinc in adhering to and protecting the under surface, with the further advantage in favour of the iron that it does not dissolve or rust in sea water or other weak saline solutions.

At a meeting of the Physical Society, on the 17th ult., Captain Abney, R.E., read a paper treating upon the theory of the formation of the photographic image, introducing his subject by a brief *résumé* of the theories hitherto held upon the question—the molecule of bromide of silver by those holding the chemical theory being looked upon as split up into a sub-bromide and bromine; but, by the holders of the opposite or physical theory, the molecule is supposed to undergo a mechanical change only. Quoting from the report at our hand, Captain Abney is stated to have performed the following experiment:—A portion of a dry plate which had been exposed was wet with a sensitive collodion emulsion of bromide of silver, and developed by the alkaline method. The films were separated from the glass and from each other by means of gelatinised paper, and were found to bear images; and the same result was obtained when the emulsion was added after exposure, development, and fixing. These experiments entirely disprove the supposition that only those molecules acted on by light are reduced. If the two films be separated by a thick layer of albumen the lower picture developes as a negative and the upper as a positive.

In *Comptes Rendus* for March 7 are details of a process, by M. Zinno, for preparing oxygen on the large scale by a wet method. He causes permanganate of potassium to react on binoxide of barium diluted with water.

On the 31st of March Professor James Dewer, M.A., delivered at the Royal Institution a lecture on the *Physiological Action of Light upon the Eye*. The subject is very interesting, but scarcely suitable for more than a passing notice in these columns, except in so far as it might throw incidental light upon the theories just alluded to. The investigations made by the lecturer, in conjunction with Dr. M'Kendrick, of Edinburgh, seem to show that the specific effect of light upon the retina and optic nerve is a change in the electro-motive force of those organs. A brief account of these discoveries will be found in *Nature*, July 10, 1873, and the lecture is being published *in extenso* in the same journal at the present time.

Among the most useful of all chemical text books is Fownes' so-called *Manual of Chemistry*. The publishers at last seem to be aware that its size and thickness must tend to injure its usefulness, and now they have at last determined to make two volumes of it, which will be sold separately.

Meetings of Societies.

GLASGOW PHOTOGRAPHIC ASSOCIATION.

A MEETING of this Association was held on Thursday, the 19th inst., at the Andersonian University,—Mr. John Stuart, President, in the chair. The meeting was a "popular" one for members and friends.

Dr. JOHN NICOL, of Edinburgh, gave an interesting descriptive lecture on Aberdeen and its surroundings. The pictures were by Messrs. G. W. Wilson and Co., Aberdeen. The series was a large one, and every picture was a subject possessing interest, the positions being nicely chosen, while as transparencies they came out well on the screen.

The lanterns were supplied and managed by Messrs. George Mason and Co., and the light was clear and steady.

At the conclusion of the lecture a hearty vote of thanks was given to the lecturer. After a vote of thanks to the Chairman the meeting was adjourned.

A MEETING of the Carbon Committee recently appointed by the Association was held, and the Secretary was instructed to send the following letter to the Bristol Amateur Photographic Association:—

Mr. H. A. H. DANIEL, *Hon. Sec.*

DEAR SIR,—Had your Association resolved that application for renewal of Swan's patent in connection with carbon should not be opposed by them that would have been simple, and no one could have had the least objection; but the reasons you have given, and which form part of the resolution, were in no way warranted, and are open to objection.

You misunderstand our object in thinking we desire to disturb any one's true interests, much less that they should make sacrifices; but we wish to see to the public good. We do not object to the patent running its full course, and those interested getting the full benefit from fourteen years' rights or monopoly; our object is to try to prevent undue extension.

You say that "under existing patents good and reliable tissue is manufactured." We have no need to answer this further than to say that there are, and have been, many complaints by the users respecting the quality and irregularity of the tissues.

"Non-renewal would chiefly affect professional photographers, and would not increase the scope for fresh discoveries." We think it would affect all equally in proportion to their interests and their practice of the art, except that amateurs do not pay so much for their license; and if it be amateurs who make all the discoveries it will certainly hamper them, because they cannot do anything which may not be questioned.

"It is generally admitted as incontrovertible that few, if any, discoveries of importance have emanated from the professional community." If this proposition be incontrovertible of course there can be no answer to it; but we do not believe this can be applied to the photographic any more than to any other profession. We believe that industry, brains, and genius overcome what are called insuperable difficulties.

The steam-engine was not discovered by a professional, neither was steam navigation or railway locomotion. Sir William Thomson is not a professional electrician; Arkwright was not a professional spinner; Dr. Livingston was not a professional missionary; Daguerre was not a professional photographer, nor Fox Talbot, nor Archer, nor Swan, nor Johnson, and we suppose that even Lambert cannot claim that designation; yet were they not all really professionals? We think they were, and claim that they have all been as much professionals as any others who can be thus designated.

Our Committee have given instructions that this answer should be forwarded to your Association, to which we, at the same time, desire to show all respect and to present our good wishes.—I remain, dear sir, yours respectfully,

Glasgow, April 19, 1877. ARCHD. ROBERTSON, *Hon. Sec.*

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BERLIN PHOTOGRAPHIC SOCIETY.

AT a meeting of this Society, held on the 2nd ult.,—Dr. Vogel, President, was in the chair. The proceedings were commenced by the admission of three new members.

A provincial member asked whether films of leather collodion were to be bought from the trade. The use to which the questioner wished to put them was to the production of Denier effects, by laying them between the plate and the print in the printing-frame. The meeting believed that such films were not in the market, but

Herr BOLL recommended for that purpose the gelatine films, which are sold, both white and coloured, at a shilling a sheet.

Herr PRÜMM thought it would be advisable to protect these sheets of gelatine against the effects of damp by coating them on both sides with collodion. He also recommended that the cases used for containing them when travelling should be coated, as a protection against damp, with leather collodion, prepared by adding one part of castor oil to a hundred of two-per-cent. raw collodion,

The PRESIDENT then read a circular relating to M. Vidal's photochromes, in which Herr Richard Holle was appointed agent for Germany, and a list of its various applications to the reproduction of oil paintings such as those in the Louvre, &c., were enumerated. He (the President) then remarked that he learnt from the circular that M. Vidal's process, which until now had been principally recommended for portraits, was found to be adapted for the reproduction of oil paintings and other works of art. Indeed, the specimens applied to art-industry, such as patterns for carpets, &c., which he saw at Philadelphia, were really better than the gaudy portraits, which gave the impression of being indifferently-well coloured photographs. He could not, however, say that the reproductions of oil paintings were to his taste; but in order that the Society might judge of them for themselves he advised the purchase of a specimen of the process.

Herr SCHAARWÄCHTER agreed with the President.

Herr HARTMAN thought Herr Holle would likely lay a few specimens before the Society, but the purchase of one was in the meantime resolved upon.

Herr Martini showed a collection of carbon potraits by Dr. D. van Monckhoven, of Ghent. These pictures were printed, some in black and some in brown, and enamelled with collodion, and had a brilliancy of tone which spoke well for the tissue used. This, Herr Martini said, was manufactured for the trade by Dr. van Monckhoven himself, and he took this opportunity of distributing pieces for trial to several of the members present.

Herr Garbinsky, as the representative of MM. Braun and Co., of Dornach, showed some carbon prints transferred upon very pale blue paper, being glacier landscapes taken from nature. The bluish tint of the support imparted great *vraisemblance* to the masses of ice. He then tried to make a communication about a method of producing pictures in polychrome which was very similar to that of M. Vidal; but, owing to the difficulty with which he expressed himself in German, Herr Prümm was induced to speak for him.

Herr PRÜMM said that while M. E. Braun had stayed with him for a few days he had given him a practical demonstration of the way to manipulate Braun's carbon tissue. In making the coloured pictures a carbon print was taken, and before being transferred the second time it was coloured with flat tints and then transferred, so that the colour lay under the picture film. The colours used for the purpose were supplied by MM. Braun and Co., and were specially prepared so that they might be used like water colours, yet they must not be soluble in water. It would be remembered that Herr Grüne mentioned the same idea at a meeting of the Society some time ago, but his experiments were unsuccessful, owing to his not being able to procure or prepare suitable colours. He (Herr Prümm) also said that in the Braun establishment the negatives were drawn off the glass and stored between papers, so that they could be reversed at pleasure, as they were often required to be for lichtdruck, and it was very convenient to have them for carbon work, so that proper positive prints might be got by single transfer. The plan adopted in that establishment for drawing off the negative was as follows:—The glass plates are polished perfectly clean and well rubbed with a little talc; but on no account are they albumenised or furnished with anyother substratum which would cause the film to adhere more firmly. The negative is produced on the plate as usual, and when fixed and washed the plate is allowed to become half dry, when it is coated with a mixture consisting of—

Gelatine	100 parts.
Water	400 ,,
Glycerine	10 to 15 parts.
Alcohol	100 parts.

The plate is then dried in a few hours by a gentle heat. When dry it is coated with one and a-half per cent. raw collodion, and again left to dry; then the film is cut through round the edge, when it may be easily removed, and, indeed, sometimes springs off of itself. In the printing-frame these films require a greater pressure than glass negatives. Braun's people use for that wedges of vulcanised india-rubber about the thickness of one's finger.

[With reference to the great advantages to landscape photographers of being able to draw off the negatives, Fraulein Plank says that during her photographic tour in Italy she drew off every evening, in the way described above, the negatives taken during the day, and thus escaped all danger of breakages while travelling, and the disagreeable necessity of dragging about large quantities of glass plates.]

Herr Martini showed a few coloured pictures, by Nestler, of Vevay, which had apparently been produced by the method just spoken of by Herr Prümm.

The PRESIDENT then directed attention to the recently-discovered photographic process that goes on in the human eye.

Herr PICHTER thought it would be very interesting to know whether the formation of those pictures was continually going on in the eye, as in that case the photo-mechanical process must proceed with almost incredible rapidity.

The PRESIDENT did not think any one was at present in a position to answer these and similar questions, though they were certainly interesting.

The discussion gradually came round to the picture of the murderer in the eye of the murdered, and other cases alluded to in newspapers or romances.

Herr QUIDDE thought that all such statements were mere productions of the imagination.

The PRESIDENT remarked that, according to the experiments known as yet, the image on the retina disappeared quickly and could only be fixed under exceptionally fortunate circumstances by the help of an anatomist. These favourable circumstances would, however, not be present in the murder case, so that those remarkable cases might be regarded as myths.

After some other matters had been discussed the question was asked—"What can be done if one wish to remove part of a burnt-in picture?"

The PRESIDENT said Herr Grüne had shown that burnt-in pictures could be removed by means of fluoric acid, without injury to the surrounding parts.

The meeting was shortly after adjourned.

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FRANKFORT-ON-MAINE PHOTOGRAPHIC SOCIETY.

A MEETING of this Society was held on the 8th January,—Herr Geldmacher, in the chair. Herr Aubel, of Cologne, was introduced and gave some of the promised details as to his celebrated process.

Herr AUBEL began by saying that his process had nothing in common with the etching by hydric fluorine described at the previous meeting, as everyone present would soon be able to testify. He thought that he might say that it was the most universally applicable of all printing methods resting on a photographic foundation. It permitted him in a very short time to prepare the photograph for printing in connection with ordinary letterpress, and for the topographic Schnell press as zinc plates, as stone for the lithographic press, and as copper for the copperplate press. The preparation of a plate for the ordinary book-printing press, inclusive of the taking of the photograph, only required three hours, while that of the other two sorts required eight hours. Though his process was divided into these principal divisions on stone, copper, and zinc plates, it was to the last, as applied to printing with letterpress, that he had devoted most attention, as being that likely to be most largely employed. The plates for the book press were thick, highly-polished zinc plates, which were made fast upon a wooden couch. For the Schnell press quite thin sheet zinc was very suitable, being extremely pliable, and thus lying close to the cylinder of the Schnell press, and also having a great advantage in cheapness. Such sheet zinc cost but one mark (one shilling) per quarter-sheet, while the thick, highly-polished sort cost twelve thalers (about £2). The largest sizes only were printed from stone up to fourteen square feet. He (Herr Aubel) then showed a number of zinc printing plates of about 50 × 40 centimetres, having the appearance of negatives, the hollows in the plate which corresponded to the lights in the impression being black, while the parts corresponding to the shadows had a high metallic polish. He laid stress upon the fact that his plates were prepared by a method the opposite of the etching manner. As the action of the etching medium was always equal, it followed that the etched places were all the same depth, consequently the requisite gradations of depths could not be got without having recourse to the graver. He employed the opposite plan. He left all the places that took on colour, and hollowed out those that took on no colour. The blank polished zinc plate then afforded the finest gradations. To show that the mirror-like upper surface remained intact he (Herr Aubel) showed a plate from which 2,000 impressions had been taken, and which was still perfectly good. The plate was a reproduction of a copperplate etching of Le Brun's *Entry of Alexander*. The size of the original was eight square feet; the zinc plate was about 40 × 30 centimetres. He affirmed that he got as good impressions from his zinc plates as from woodcuts, though, of course, a good deal depended on the dampness of the paper, the quality of the ink, and the proper pressure of the cylinder; but in all those matters it was easier to print from zinc than from wood. The zinc plates had also the advantage of not becoming distorted. He showed further a printing plate of thin zinc for the typographic press, and pointed out how convenient it was to produce one's printing plates in that form and to be able to store them by thousands in a few boxes. Another plate, an illustration for *Der Hinkende Bote* ("The Limping Messenger"—a popular almanac), showed quite different properties. It was in extremely strong relief, like a woodcut, but the depressions were not cut down perpendicularly, as was the case with etched plates, but were trough-shaped—V. Those plates were made, or rather manufactured, in immense numbers at Herr Aubel's establishment—such a plate, twelve centimetres square, costing from fifteen to twenty shillings. As a specimen of how far a picture might be reduced without losing details a production of Kaulbach's *Heath Rose*, might be mentioned. He (Herr Aubel) also showed his first experiments in the direction of direct negatives, such as a plan of Cologne, measuring ten feet, printed from stone, and some prints upon a collodion film, indistinguishable by the naked eye, intended for the pigeon post. Lastly Herr Aubel mentioned the fact that by his method he could etch either the lights or shadows, and thus obtain the print either as a black picture on a white ground or a white picture on a black ground. He divided his prints into three classes:—

1. *Original or Ball Prints from the Engraved Plates.*—The treatment of those was similar to that of line-engraved or stippled copperplates, but the prints were pulled with the lithographic press. From those plates, with fatty ink and Chinese or chalk paper (*a*) a transfer upon stone was made, which was prepared by etching, rubbing, &c., in the usual way for the lithographic hand or Schnell press; or (*b*) the transfer was made to a zinc plate to be prepared galvanically for the topographic, cylindrical Schnell press; or, lastly (*c*), the transfer was made upon wood, when it took the place of a xylographic drawing.

2. *Ordinary Lithographic Prints by Roller and Press of the Original Engraved Plates.*—As the ordinary blackening of the engraved plates with ball was troublesome and the printing from them took a long time, the inventor had devised that special process, which almost equalled in rapidity and ease of production the ordinary lithographic press, and furnished proofs quite equal in clearness and sharpness to those from specially engraved plates.

3. *Direct Roller Prints from the Plates of the Original Photographs.*—As in those neither transfer nor any species of etching took place, prints obtained in that way might be regarded as perfect camera pictures reflecting the natural texture of nature. Amongst the specimens shown, which were produced in that way, were—the *Hare in its Form*, the *Rabbit in its Hutch*, the *Gravestone*, the *Peach Branch*, &c., &c.

The Chairman thanked Herr Aubel for his interesting remarks and display of specimen plates and prints.

A number of other lichtdrucks, Woodburytypes, &c., by various photographers, were then laid on the table, and, after they had been examined, everyone present would soon be able to testify.

Herr von Bosch rose and spoke of the special disadvantages to the photographer of the credit system. The general merchant could generally, if his wares were returned, dispose of them otherwise; but to the photographer, who had the picture he produced, at the expense of time, trouble, and materials, returned on his hands, it was of no further use if he could not get paid for it by the sitter. He, therefore, recommended that the number of prints ordered at a sitting should only be furnished when paid for in advance.

There was little more business transacted, and the meeting was adjourned shortly afterwards.

A subsequent meeting of the same Society was held on the 22nd January last

The **President** said that, sometimes, when he wished to develope an exposed plate it would be a long time before the picture appeared, and when it did at length come suddenly, the shining parts were very harsh and the result a picture in strong contrast. After many attempts to discover the cause he (the President) found that he had been using plates that had previously been used, and that as soon as he took new plates the development went on as usual. He, therefore, supposed the phenomenon was caused by a chemical action on the part of the imperfectly-cleaned plates. [Why not try the plan of cleaning the old glass perfectly, and so doing away with the chemical action?]

Herr **Geldmacher** said the Photographic Society of Cologne intended to make an historical collection of photographic apparatus, and he recommended the project to the Society for imitation.

The further proceedings were of no general interest.

At a meeting of this Society held on the 7th February, owing to the absence, through illness, of the President, Herr van Bosch, the chair was occupied by Herr Geldmacher.

Dr. Schleussner gave a condensed account of a recent article in The British Journal of Photography, by Mr. Laws, treating of the *Spots on Prints*.

Dr. **Stein** said a few words about the employment of photography for the automatic drawing of barometric and thermometric observations.

Herr Haake then read a prospectus recommending a varnish for enamels, invented by Herr Kesseler, of Frankfort. He also showed a few photographs coated with the varnish, which had a remarkably high glaze.

The meeting was then adjourned.

At a meeting of the same Society, held on the 21st February, Herr van Bosch was present, and took the chair again, as usual. After some purely personal matters had been arranged,

Herr **Maas** asked what was meant by photographs taken in the "byzantine manner." He had lately seen an advertisement in a daily paper in which the expression was used.

As none of the members present could give the desired explanation the Secretary was instructed to ask it, in the name of the Society, from the advertiser.

Dr. Schleussner then read a paper on the recovery of the gold from old gold baths.

The proceedings were brought to a close by a discussion on the superiority of aplanatic over other lenses.

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RHEINISH WESTPHALIAN PHOTOGRAPHIC SOCIETY.

A meeting of this Society was held at Cologne, on the 5th January, Herr Baumann in the chair.

Herr **Bruno Risse**, of Dortmund, gave the following directions for retouching gelatine pictures:—He would take a small tube of black or Cassel brown oil colour and press out a drop of the colour upon a palette and there mix it with a few drops of drying oil and of poppy oil, and finally mix the whole with turpentine. With this mixture, he said, it was very easy to retouch, as it dried quickly, and there was no fear of dissolving the colour. He was sure anyone who tried that plan would be pleased with it. [A year or so ago mention was made in The British Journal of Photography that oil colours were successfully used for retouching by Mr. Bashford, of Portobello.]

Referring to some remarks on the retouching, &c., of gelatine pictures, made at a previous meeting,

Herr **Kremer** said that he prepared his plates so that the gelatine adhered so fast that it could not be removed without injury to the picture. He thought the springing off of the gelatine was not caused by the water, as Herr Meissner seemed to think. He retouched with pure indian ink, and by his method of procedure the ink was not washed off. He did not approve of coating the retouch with collodion, as it did not adhere always to the gelatine.

Herr Kremer having communicated these remarks by letter, it was resolved to ask him to give the details of his method at some subsequent meeting.

Herr **Schönscheidt** observed that sometimes when he was using rain water for gelatine pictures the results would suddenly become bad, but that as soon as he began to use the water from the pipes they would be good again. This bad effect of the use of rain water occurred whenever there was a fatty skin to be seen on the latter.

Herr **Creifelds** thought that the addition to the gelatine of carbon tissue, of sugar and various gums, as well as of the alkaline chromic salts, such as ammoniac chromate, but not chrome, would be advantageous.

Herr **Guntermann** thought the sugar, &c., would be apt to cause fermentation.

Herr **Criefelds** assented, but proposed to add a little carbolic acid to the paper to make it keep. When he intended to use the gelatine for lichtdruck he poured alcohol over it. The sensitising solution he prepared by adding ammonia to a solution of bichromate of potassium until the solution became yellow and smelt of ammonia.

In the question box were two questions:—

1. How may rents in the varnish of negatives be removed?

Herr **Criefelds** had been frequently troubled by worm-like rents in valuable plates, and tried a variety of ways of removing them. With fine powder he got no good results, nor with rubbing in black with oil of turpentine; indeed, that sometimes loosened the film. He now always used a little dust from a corner of the studio rubbed in with a piece of wadding. Of course when the rents were wide they must be filled in by retouching.

Herr **Brischke** used powder scraped off lead pencils.

2. When negatives become damp, the varnish, and with it the collodion film, rises up and forms inequalities; consequently, when pressure is applied, the puffed-up or inflated parts burst, and the plate is destroyed. Are there any means of saving these plates?

Herr **Criefelds** recommended that the plate should be laid, varnish side downwards, upon a vessel filled with equal parts of ether and alcohol, when the film would be softened and lie down again flat. The varnish might also be removed by dissolving it at once with alcohol and potash, but that often displaced and injured the collodion film.

There was no other business of interest, and the meeting was shortly afterwards adjourned.

On the 19th January another meeting, also presided over by Herr Baumann, was held, at which most of the business transacted was of purely local interest.

◆

Correspondence.

CHROMOTYPE AND PATENT RIGHTS.

To the Editors.

Gentlemen,—In your issue of yesterday there are three points which I think it right to comment upon with regard to the chromotype process. I must, however, premise that I am personally a licensee.

The fourth clause of my license is as follows:—"That the said licensee shall not sell, give, or lend any of the *special* tissue or materials reserved for chromotype printing to any party not having a license to use the same." This is a contract, and, as a contract, is binding not only on myself but on the Autotype Company, who have granted me the license on the basis of the license having been signed *in duplicate* by both parties.

To Mr. Samuel Fry's remarks I would simply say that he knows nothing about the matter, as I believe that autotype and chromotype are perfectly distinct. I consider his remarks on the patentees as, perhaps, libellous, because I read them as accusing the Company of vending the same tissue to very different persons—some non-licensees—representing that they are different materials to different persons, whereas he asserts that they are the same tissue.

I have reason to believe that the tissues issued to the autotype and chromotype licensees are widely different. I have seen both worked, and I do not believe Mr. Fry's statement for one moment; if I did I should consider myself "done."

I am glad you have answered J. D. Cooper as you have, "even" though "Free Lance' differs from you. Truly the latter is well named. I have not a word to withdraw from what I have already written, and agree with you that "patent rights" are only the due reward of the ingenuity or ability of anyone, and most decidedly are the just rights of those who have paid large sums of money for the brain-work of others. It is, in fact, a property purchased, and it is as much a trespass to work the patented process without a license as though the trespasser were to think it proper to trample down a crop of my wheat.—I am, yours, &c., Thos. Parkyns.

Harnham Cliff, Salisbury, April 21, 1877.

CARBON LICENSES.

To the Editors.

Gentlemen,—After the rejoinder made in yours of the 20th, by Mr. S. Fry, it seems scarcely necessary for us to trespass further upon your space.

Mr. Fry comments upon the personal tone of our letter. How could it be otherwise? He names us by name, and makes false and calumnious charges against us by name—charges which, if believed, would certainly affect our honour and credit with the profession; and we think it would be difficult for even Mr. Fry's ingenuity to avoid the necessity of a personal tone in the reply. His case having utterly broken down, in place of retractation or apology he finds fault with the tone of our reply.

Since the publication of Mr. Fry's first letter we have been amazed at the documentary evidence that has been produced to us. Will it be believed that at the very time Mr. Fry was advertising "No license is required" he wrote with his own hand, and signed with his own name, a letter in which he informed his correspondent that "the Autotype Company charged £30 for a license?" This shows that he knew perfectly well that a license was necessary and that his public statement was untrue and misleading.

In January, 1876, upon our completion of the purchase of the whole of the business of the late Autotype Company, we inserted in both the journals a full-page advertisement for many weeks, announcing the fact that we required certain payments for licenses to use the autotype patents and fully setting forth the conditions; how does Mr. Fry reconcile this fact with his public announcement of "No license is required?"

We shall leave Mr. Fry and the "Veteran" to settle the question of authorship between them; it is to be hoped that Mr. Fry's appreciation of "internal evidence" is much more to be relied on than his statement of fact.

We decline to accept any kind of challenge from Mr. Fry; our tissues and materials are easily obtainable by licensees, and they can see for themselves. It really appears as if Mr. Fry were as unable to perceive the gradations and differences of colour as he is to appreciate the necessity of honourable and straightforward conduct in matters of business.—We are, yours, &c., The Autotype Company.

April 23, 1877.

To the Editors.

Gentlemen,—In your issue of the 13th instant was a letter from the Autotype Company, in which they put forth their view of the matter of the use by the profession of their patents. Please allow me to put forward another side.

The Company announced the free use of their patents, for certain purposes, upon the condition that materials were supplied by themselves; nothing was said about the offer being only for a limited time. Three years ago I accepted that offer and have continued to buy materials, sometimes from them and sometimes from their agent.

Eighteen months ago I decided upon abandoning silver printing and from that date have not produced a single silver print. I announced to my customers that I should issue all my work in carbon, and have no desire to change; but the Autotype Company now say—"Pay us five pounds, or cease working."

I think, gentlemen, you will agree with me that, whatever the legal aspect of the question may be, the moral one is that I am entitled to have materials from them, and to continue the use of their patents upon the old conditions.—I am, yours, &c., An Annoyed One.

April 24, 1877.

[Our correspondent, who encloses his name and address, has, in our estimation, an honest grievance, and his position is one which cannot fail to elicit sympathy. But the Autotype Company seem already to have had the case of such experimentalists under their special notice, for in the advertisement of the Company, in our last issue, we read as follows:—"Notice.—To those photographers who have been in the habit of regularly purchasing tissue and materials of the Company, and working the processes under the former conditions, and who have thus practically helped to resolve the difficulties of permanent photography, the Company will, in acknowledgment of their assistance, grant an autotype license on payment of five shillings for the stamp." From this it will be seen that our correspondent, and all who are placed in a similar position, are to have their services thoroughly recognised in the way indicated.—Eds.]

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The Best Process for Producing Transparencies.—At a recent meeting of the Photographic Section of the American Institute, Mr. Roche gave his opinion on the merits of certain photographic processes as applied to the production of transparencies. Emulsion plates, he found, gave the finest films; good bath plates came next in order, and carbon last, and that silver pictures for transparencies gave brilliancy and most contrast.

Photography in Court.—Parryman *v.* Melon.—The plaintiff, a photographer, in Camden Town, sued the defendant to recover £7, under the following circumstances:—The plaintiff was instructed to produce six enlargements from a daguerreotype, at 25s. each. These were delivered in February and returned in a damaged condition in April, when the plaintiff refused to take them back. When delivered, the defendant had expressed himself satisfied with the work, but he subsequently complained of the price and offered to return them—an offer the plaintiff declined, more especially as the defendant's wife and others had expressed themselves satisfied with the work. It was proved that the price was a fair one. The defendant said the contract price was 18s., and not 25s. each; and when the order was completed and the bill received he repudiated the transaction and returned the pictures. A witness stated that the price charged for such work was high to a ridiculous extent. The judge ruled in favour of the plaintiff for the full amount with costs.

EXCHANGE COLUMN.

Wanted to exchange, a 12 × 10 rolling-press for Fletcher's gas furnace.—Address, H. C. J., Queen-street, Norwich.

Wanted to exchange, a Dubroni's photographic apparatus, complete, with box, camera, stand, chemicals, pipettes, printing-frame, and book of instructions, for a cheap *carte-de-visite* or cabinet rolling-press.—Address, A. A. C. Swinton, Kimmerghame, Dunse, N.B.

◆

ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

Notice.—Each correspondent is required to enclose his name and address although not necessarily for publication. Communications may, when thought desirable, appear under a *nom de plume* as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

Amateur.—You must use a lime light and iodised paper. The image must be developed with gallic acid.

Anglo-Celtic.—Our correspondent would like to obtain some particulars respecting the printing-frames made use of in the establishment of Messrs. G. W. Wilson and Co., Aberdeen.

G. W. T.—The Lambertype patent consists in attaching a sheet of paper to *both* sides of the negative. M. Lambert, however, has obtained other patents beside that just indicated. These have been published in our last volume, to which we refer you.

F. B. S. (St. Saviour's).—1. The lens by the foreign maker works with greater rapidity than the other, but does not include quite so large an angle.—2. Sensitise the paper with ammonio-oxalate of iron, and after exposure develope with ferrid-cyanide of potassium.—3. The *Agenda*, and *Photographie Au Charbon* may be obtained from M. Gauthier Villars, Paris, or at Librairie du Moniteur Universel.

South African.—We decline to commit ourselves to any opinion concerning the "morality" of such an action as that involved in the retouching of a Roman nose to such an extent as to leave it of a *retroussé*, if not of a "pug," character. Apart, however, from morality—into which theme we shall not venture at present—it is a great blunder for any retoucher to alter the character of his work, especially to take such a great liberty with a lady's prominent feature.

James Cantlie.—Yes! even out of a potato—sneer as you may at the versatility of dry processes—might a "process" be obtained. If the starch abounding to so great an extent in the valuable tuberous appendage to the root of the well-known plant named were properly used it might be found to yield an organic film that would prove of much benefit in dry processes. Gum, gelatine, and albumen, have rendered excellent service in photography, and why not starch? and if starch, why not *potato* starch?

Richard Horton.—Our correspondent says:—"I have been practising with some plates prepared by Canon Beechey's formula, given in the Almanac of last year, with the intention of using the process this season, but have met with a difficulty. When developing a negative with either trees or chimney-pots projecting into the sky they are (the trees, &c.,) fogged all over more or less. With a transparency the effect is similar. In a negative it appears as though the density of the sky washed over. I shall feel very much obliged if you will let me know a remedy for the above rather serious defect, as in other respects the plates are first-rate. I use Ind, Coope, and Co.'s X K. S. ale in the preservative."——The effect described is that known as "halation," or "blurring." It can be prevented either by increasing the density of the sensitive film or, preferably in this instance, by giving the back of the plate a coating of a deep brown or non-actinic varnish easily soluble in water.

R. H. Anderson.—This correspondent is desirous of trying the method of intensifying negatives by means of bromide of copper, but he is met at the threshold of his experiments by the serious difficulty that from no chemist in the venerable city in which he resides can he obtain the salt in question. He inquires if it be a commercial production, and, if not, how it can be prepared.——We reply: Bromide of copper can be procured from any of the leading chemists in London. It may, however, be easily prepared in the following manner:—Make a saturated solution of sulphate of copper, and to this add sufficient of a solution of bromide of potassium (strength immaterial) to produce an action when poured upon a wet collodion negative. Let the strength be such as to cause the image to become white within a few seconds after application. Bromide of copper prepared in this manner is, of course, not pure, but it is sufficiently so for the purpose intended; and it was in the way indicated that Mr. Warnerke prepared the solution by which he conducted the experiments we have lately recorded.

J. Hunter.—A Coddington lens of small dimensions will prove sufficiently powerful to enable you to see the granules of silver of which a collodion image (obtained by the wet process) is composed. But for subjecting to examination the images obtained on *bromised* films such a magnifier will scarcely possess sufficient power. For that purpose a triplet, such as a French sixth or eighth-of-an-inch microscopic power, will be better, the convex surface being next to the eye. All this is on the assumption that you find it inexpedient to use a compound microscope, which certainly would make a very extraordinary-looking ornament to attach to your watch chain. A Wollaston doublet having a focus of nearly one-twentieth of an inch has frequently been employed by us for this purpose, and for several years we had it so mounted as to form an "appendage" of the nature desired by you. Any skilful practical optician can easily make to order what will suit your requirements. We shall be glad to hear from you upon your arrival in Hiogo, and to receive the specimens of Japanese landscape photography.

R. P.—Your queries cannot be answered until you comply with our rule respecting attaching the names and addresses of correspondents.

Ignoramus.—Unless you are an "expert"—a conclusion at which, judging from your letter, we are scarcely justified in arriving—we very strongly advise you to avoid making purchases in auction-rooms in the expectation of obtaining bargains. Apply, instead, to any respectable dealer, who, having a character at stake, will, for his own reputation, supply only articles that will give satisfaction.

A. W. H.—The Amateur Field Club is, in a certain sense, a private one, and hence we would not be justified in affording you, through the medium of this Journal, the information you desire. But if you call at our office we shall willingly show you the rules, the list of members, and also the programme of intended proceedings for the present year. The Dry-Plate Club was quite a different Society, founded for a distinct purpose; but it could scarcely be said to have well entered upon existence ere it went the way of many other Societies, and crossed the Stygian ferry.

Received.—F. Gutekunst; Syntax.—In our next.

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BABY'S PORTRAIT.

Caught by the sun, the smile on her parting lip;
Caught by the sun, the gleam in her clear grey eye;
Caught by the sun, the light on her fingers' tip;
Caught by the sun, between a laugh and a cry.
Greatest pleasure, little treasure, thus to see
Thy joyous face, full of grace, smile on me;
May thy life, free from strife, its smooth course run;
Thy face dear, as 'tis here, caught by the sun.

Mark Oute.

◆

South London Photographic Society.—At the next meeting of this Society, on Thursday next, May 3rd, in the rooms of the Society of Arts, John-street, Adelphi, a paper on *Photographic Difficulties* will be read by Mr. F. York.

Trade Catalogue.—Once more we have to acknowledge the receipt of a copy of a new issue of the well-known catalogue of new and second-hand cameras, lenses, and photographic appliances so long supplied by Mr. William Morley, of Islington. It is as varied and suggestive as ever, and teems with a plethora of good things.

Alleged Exposure of Indecent Prints in Glasgow.—On Friday last, the 20th instant, at the Central Police Court, Glasgow, Mr. William Roger, as representing the firm of Messrs. Scott and Roger, tobacconists, was charged with having offered for sale or distribution indecent or obscene prints or photographs. Lieut. Strachan and Superintendent Hamilton proved the purchase of cigarette boxes on which the alleged indecent photographs were displayed. Mr. Roger denied that the pictures were indecent, and called witnesses to support his allegation. The defendant stated they were simply waste copies of cards of actresses in character, that photographers could not sell for a shilling or sixpence, and they sold them to manufacturers. He had been supplied with similar boxes from many places, and they were sold without the least hesitation. If the police had warned him that they were indecent he would have taken them out. If the two witnesses for the prosecution had walked up and down Buchanan-street they would have seen things equally as bad. Mr. Lang (the prosecutor) said he would make a clean sweep of these things. Mr. Gemmel (the stipendiary magistrate) said he had no difficulty whatever in holding that the representations on the boxes—particularly two of them—were indecent and obscene. He imposed a fine of £2, with the alternative of fourteen days' imprisonment.

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LONDON GAZETTE, *Friday, April* 20, 1877.

Partnership Dissolved.

Warlich and Hyne, Grove Lane, Camberwell, and Brunswick Place, Blackheath, photographers.

METEOROLOGICAL REPORT.

Observations taken at 406, Strand, by J. H. Steward, Optician.
For two Weeks ending April 25, 1877.
These Observations are Taken at 8 a.m.

April.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks.
19	29·89	E	40	44	52	40	Dull
20	30·24	NE	39	41	57	35	Hazy
21	30·06	SE	45	46	55	39	Raining
23	29·58	NW	42	45	57	40	Cloudy
24	29·68	E	43	47	57	39	Cloudy
25	29·92	E	42	45	—	38	Cloudy

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 887. Vol. XXIV.—MAY 4, 1877.

M. CHARDON'S EMULSION PROCESS.

We left off in our description of this process last week having completed the first stage of the emulsion, namely, its sensitising, and have now to describe its correction and the subsequent operations. As before stated, the emulsion requires to be left for thirty-six hours after the silver is added in order to acquire its full sensitiveness, when it is to be "corrected" by the addition of the requisite quantity of the chlorised collodion of which we have already given the formula. According to M. Chardon's instructions we added, after the interval directed, one drachm of the cobalt collodion to the six ounces of emulsion, and after the lapse of twelve hours we again tested for free silver. The emulsion was now found to be as nearly as possible neutral; if anything, it showed an extremely faint trace of silver—so faint, however, as to render it doubtful, without adopting a very careful method of testing, whether free silver was really present. In order to completely neutralise the silver and leave a slight excess of soluble haloid, we then added a third of a drachm of the chlorised collodion, and then proceeded to the next operation—the washing.

This is performed by precipitating the emulsion with cold water, instead of pouring it out and allowing it to set, as is usually done, and then washing the pellicle thus formed. Mr. M. Carey Lea recommended this plan in our columns about twelve months ago, but laid stress upon the importance of pouring the water (or preservative solution) into the emulsion, while M. Chardon's method consists of a directly opposite course—the emulsion is poured into the water. Whether it be owing to this reversal of the order of procedure, or to the nature of the pyroxyline, we have succeeded much more perfectly in securing a successful result with M. Chardon's process than we have ever previously done when following the precipitation method; for, though we have succeeded in so washing emulsions, a very large proportion of the material has been lost, and the result has always been more or less uncertain. In the present instance, however, after allowing for a slight loss arising from a misapprehension as to the character of the precipitate, of which we shall speak presently, the product, when dried and weighed, was little short of what we should expect to obtain from the same emulsion if washed in the ordinary manner.

A forty-ounce glass measure was half filled with cold water and the emulsion was poured into it in a thin stream, the whole being vigorously stirred with a bone spatula during the operation, and for a minute or more after all the emulsion had been added. The result was the formation of a quantity of light, thready matter, which floated upon the surface, and a considerable proportion of coarse powder, which settled to the bottom of the water. The bulky, floating portion was then removed, by means of the spatula, into another vessel, and, after washing in three changes of water, was squeezed through a cloth and spread between blotting-paper to dry. The remaining powdery portion, after washing in two or three waters, was also collected upon a cloth filter, and would have been added to our residues, under the impression that it was merely silver bromide which had separated from the cotton, had not its coherent nature when squeezed free of water led to a doubt upon the point. A few grains were added to a small quantity of a mixture of ether and alcohol, when we were surprised and pleased to find that it dissolved perfectly without the slightest trace of granularity. The powder was therefore added to the other portion, and the whole dried at a heat of about 180° Fahr.

It will thus be seen that two distinct products are formed, doubtless owing to the employment of two samples of pyroxyline of such widely-different properties; but what may be the respective parts played by them in the final emulsion we are, as yet, unable to say. We have remarked upon previous occasions this separation of the solid matter into two portions when the emulsion is precipitated by the addition of water, or *vice versâ;* but we have invariably found the powdery portion to consist of silver bromide alone or in combination with so small a proportion of cotton as to be incapable of re-emulsification. In attempting to trace this difference in the behaviour of M. Chardon's emulsion to its source we can only suppose it to be due to the employment of the precipitated cotton; for, though a very great difference in the character of the deposited emulsion is brought about by varying the mode of precipitation, we have not found it to extend so far with any other sample of cotton. Furthermore: we have prepared precipitated cotton according to the directions given by M. Chardon, but using Rouch's pyroxyline, and we find that an emulsion made from this and re-precipitated gives a product varying but a few grains from the theoretical weight, whilst an emulsion made from the same cotton with only the final precipitation loses from twenty to thirty-five per cent.

As regards the method of precipitation: it appears to be essential that the emulsion be poured slowly and in a fine stream into the water, a much firmer and more easily-manageable precipitate being thus obtained. It would seem that the sudden absorption of the solvents by the water precipitates each individual drop of emulsion separately in distinct tufts; whereas, if the emulsion be poured into the water quickly and in a mass, the solvents are abstracted more gradually, and the precipitate is finer and less easily collected, even the more solid portions being of a slightly "pasty" character. It is unnecessary to employ a larger quantity of water than that given above, or about four times the quantity of the original collodion; if more be used it only adds to the difficulty of manipulating the finer portions of the precipitate. In leaving this portion of the process we may remark that the employment of precipitated pyroxyline renders the method of washing an emulsion by precipitation practically useful, because it reduces to a certainty what we have always previously found to be a matter of some doubt—the precipitation in an available form of the whole of the sensitive material; hence, even if no other advantage be gained, we have at least to thank M. Chardon for simplifying the washed emulsion process to this extent.

The emulsion powder—for the term "pellicle" ceases to be applicable—was found when dried to weigh 120 grains; theoretically we should have expected about 144 grains, so that, making allowance for a known loss of some of the powdery portion of the precipitate, the percentage of loss by solution is at least much less than we have recorded on other occasions. The formula for the final emulsion, reduced as nearly as possible to English measures, is as follows:—

Ether and alcohol—each	½	ounce.
Emulsion powder	15 to 18	grains.
Quinine	¾ „ 1	grain.

The proportion of dried emulsion, it will be noticed, is smaller than usually recommended; but, though thin and transparent, the resulting films are remarkably rich in colour as well as free from grain or structure. The powder dissolves very quickly, forming in this respect a contrast to the ordinary pellicle; we were able to filter our emulsion a quarter of an hour after adding the solvents. We notice a slight tendency to the formation of streaks and mottling with this emulsion; but with care they may be avoided, otherwise we can find no fault with the appearance of the plates.

M. Chardon's original organifier consisted of cinchonine; but this he has given up, owing to the occasional formation of minute crystals in the film. We may remark that we have previously met with a similar fault when using quinine, which he has substituted for cinchonine. The "precipitated quinine" may be prepared from the ordinary di-sulphate employed for medicinal purposes by dissolving the latter in water with the aid of a few drops of dilute sulphuric acid. Ammonia is then added in excess; and the precipitate, when washed in three or four changes of water, forms the substance to be employed. It is soluble in alcohol, and may be conveniently kept in solution.

Such is an outline of the process of preparing the emulsion, the preparation of the plates containing nothing of a novel nature. It is difficult yet to say much upon the comparative sensitiveness of these plates; but we can say that, while fairly sensitive, they are by no means the most rapid plates we have prepared of a similar character. This may or may not be due to the very slight excess of silver which is present during the sensitising stage; but we are more inclined to believe that a greater degree of rapidity would be secured if some other organifier were substituted for quinine. M. Chardon, we believe, holds that the quinine acts *mechanically* only in keeping the pores of the film open, and is removed by the wash of alcohol previous to development. The latter we consider very improbable, and we know from our own experience with quinine and its salts that extremely small quantities present in the film exert an extraordinarily powerful influence upon the development of the image. Development is retarded, though not in the same manner as when bromide is used; for, with a given exposure, a quinine film will render an equal amount of detail to that which would be obtained with a similar film without the quinine, but it will require a very much longer development. It is of very great value as a fog restrainer, and may account for the remarkably clean images given by the Chardon plates and their wonderful freedom from fog or veil after a forced development.

We shall be compelled to leave over until next week the development, as we have already filled our allotted space; in addition to which we have not been able to examine sufficiently M. Chardon's method, but from what we have seen of its working it appears very effective. In conclusion: we can confidently recommend the process as fulfilling the requirements of the recent competition—simplicity and certainty; and though it is, perhaps, not equal in point of rapidity to some other modifications of the washed emulsion process, it has the advantages of being much more easily worked and more certain in its results. The expense of the precipitated pyroxyline may be an obstacle to its general adoption; but, setting that on one side, we have no hesitation in describing it as a very valuable addition to our list of processes.

STORING CHEMICALS.

Considering the virulently poisonous nature of some of the chemicals employed by the photographer, and the insidious danger incurred by the use of others—scarcely a single salt he uses being safely to be considered innocuous—it is a matter for wonder that so few accounts reach us of any accident occurring through negligence in their storage and use. We speak to some extent advisedly in using the expression, for we are not without reason for suspecting that such events of a more or less serious character do happen more frequently than might be supposed.

Discussing this matter recently with a well-known photographer whom no one could accuse of individual carelessness, and whose establishment is certainly not below the average in regard to system and general cleanliness and the intelligence of *employés*, he narrated to us some personal experiences of (to put it in the mildest form) an annoying nature, one of which might have had serious consequences, and which will afford such point to our remarks that we do not hesitate to describe them for the benefit of our readers generally. The photographer in question, who prides himself upon not sending out a single imperfect print, was annoyed by a sitter bringing him back a *carte* with two white spots upon the background. This was soon followed by another, and another, and so on, daily, for a week or more. He found it impossible to divine the cause, and blamed cards, rolling-machine, paper—everything in turn—and changed them all, but without satisfactory result. The microscope gave no clue, and the analysis of a spot was rather too much to undertake. Looking into the spotting-room one morning he glanced over a heap of a hundred or two *cartes* waiting completion, and found to his dismay nearly all so spotted. A sudden inspiration seized him. His "spotter" was a recent importation. "What do you mix your colours with?" he said. "This water," was the reply. It was not so clean as his fastidious taste required; he put it to his lips and found it to be—a strong solution of hypo.! The mystery was solved. The new *employé*, instead of going to the proper place for clean water, had turned into the toning room, which was specially understood about the place to be for the printers and the printers only, and had filled her water cup with some clear and colourless fluid which lay close at hand in a clean white dish, and used it as a diluent for her water-colours. The dish contained some freshly-dissolved hypo. for the day's prints!

His second experience consisted of a heavy loss of residues. Two large tubs full of old hypo. solution, and containing the accumulation of nearly six months' sulphides, lay outside the toning room in an entirely private yard. The caretaker had that day engaged a new lad to clean down the yard, and he, seeing two dirty-looking tubs of water, as he supposed, deliberately tilted them over and emptied their contents into the sewer, and was caught in the act of busily scrubbing the inside of one of them!

His third experience, which immediately followed the foregoing, might have had a fatal termination. One of the reception-room ladies came to her duties very unwell—so much so as to make it desirable that she should consult a medical man, who treated her for severe indigestion. Upon hearing of the residue disaster she turned pale, and said she had in a great hurry only the day before rinsed her teapot out in this "water," and, without further washing, brewed some tea in it and drank it. The illness may have been the result of the poisonous solution or a coincidence merely, and in any case it conveys a very serious warning that it is impossible to take too many precautions when dealing with such poisonous materials as, with the contempt bred of familiarity, are used so freely and carelessly every day of photographic life. We should advise that all doors of rooms not in continual use, where any chemicals are stored or used, should be kept locked when possible. Every vessel containing poison to be so labelled, and in thoroughly-legible characters, that those who run may read. Particularly in view of the eventualities which have inspired our article we think it very advisable to paint in conspicuous letters upon all the precipitating vessels the word "poison," as, little though it might be supposed that any accident *could* happen from such a source, the events we have narrated prove again the truth of the saying that "nothing is so likely to happen as the unlikely."

Further: at every studio there should be at hand in an easily accessible place a set of antidotes to every possible poison on the premises, and a set of tersely-worded instructions how to act in an emergency before the arrival of a doctor. These are precautions that cannot be too strongly insisted upon. Some day, no doubt, we shall hear of some painful accidents through non-attention to such obvious needs, and shall then begin to be wise after the event. But "prevention is better than cure," and we strongly urge upon our photographic brethren to follow the hints we have thrown out.

PHOTO-SCULPTURE.

Under the heading "A New Photo-Sculpture Process," the *Scientific American* of the 21st ult. devotes the following brief article to one of the exhibits at the Centennial Exhibition:—

"In the United States Army Department at the Centennial there was exhibited a handsome model of the Rock Island Arsenal. It is to be regretted that this work of art did not bear some description as to the manner in which it was produced—an explanation of which we find for the first time in the recently-issued report of the Chief of Ordnance of the United States army. From the various buildings, it appears, positive photographs were obtained, representing all their different sides. Each view was then exposed over a thick film of sensitised gelatine covering a glass plate, and afterwards the soluble, opaque portions of the gelatine were washed out. The film was then swelled by a peculiar process, so as to magnify its differences of level, until a suitable relief was obtained; and a plaster cast being taken of the film, it gave a permanent mould from which many repetitions could be made. A successive series of these plaster views, taken from the different sides of a house, were mitred together at their edges; and when roofed in they formed a perfect reproduction of the house itself, every stone and crevice being represented. In one building the slats of a lattice work around the piazza were plainly exhibited in lines not over 0·006 inch in width. The model was made by Baron F. Von Egloffstein, of this city."

It is very evident that some further description of the process than that given above is required. Those who are familiar with the various photographic processes which depend upon the swelling of gelatine are well aware that, while a photograph of the side of a house (for instance) can very easily be produced in relief, that relief is not dependent upon, and has no connection whatever with, the irregularities, masonry, or architectural features of the edifice, but solely with its lights and shadows. For example: a projecting balcony on the front of a house would not be represented as a projection in the gelatine photograph unless it were painted of a colour different from that of the rest of the building. It is true that, by means of judicious lighting, the balcony would in a photograph be seen to be a projection; but this effect is only obtained by the greater blackness of the paper in some places than in others. If on the front of the building—which we shall assume to have been white—there are black letters painted, all these letters will in the gelatine relief stand out in bold prominence from the flat ground; and this they will do solely in consequence of their being of a different colour, and not because they occupy a different plane, which, in the supposed instance, is not the case. Only lights and shadows, or gradations of colour, can be converted into relief; and upon this principle is based the Woodburytype and other processes.

As soon as the discovery had been made (now many years ago) that it was possible to obtain an image in relief, it was at once hastily assumed that a method had been secured of producing photo-sculpture, especially that attractive form known as the cameo-medallion. A very little reflection will show the error, because in a cameo-medallion all the parts are represented in relief irrespective of their *colour;* thus the curl of the black hair and the white cheeks and nose are equally represented in their natural relief. But when a photograph is taken of a head having black hair, and a *gelatine* relief of it obtained, this extraordinary circumstance will be found—that while the forehead, nose, and cheek will have their proper relief, the projecting curl of the hair and the projecting eyeball will, instead of having the actual relief, be represented as indented. Hair, moustache, and beard will, instead of standing out in their natural, bold relief, be sunk; and not only so, but the degree to which they are sunk will be determined by the colour—not alone merely by the colour, but by the actinic value of that colour.

Thus it will be seen, reverting to the architectural illustration referred to, that the statement made in our American contemporary does not bear upon its face such a solution as harmonises with the existing state of knowledge of the properties of bichromated gelatine. As, however, we have seen houses "built up" photographically, in a manner not greatly unlike the description given of Baron Von Egloffstein's model, by means of four gelatine *transparencies* joined at the corners, we venture to suggest that the model of the Rock Island Arsenal may have been made in a similar manner. If such a model were lighted from the inside, every stone would be represented with almost microscopic sharpness.

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It is well known that for a considerable time past the minds of astronomers have been much "exercised" by the possibility of the existence of a planet revolving between Mercury and the Sun. This suspected intra-Mercurial planet is believed to have been seen on six separate occasions as a spot on the sun's disc altogether unlike any of the ordinary sun spots. From such data as were obtainable M. Leverrier computed the elements of the new planet, and also hazarded the opinion that it would probably cross the sun's disc on or about the 22nd of March last. The Astronomer-Royal, in directing a preconcerted attack to be made upon the stranger on its appearance, had indicated the great importance of photography as a means of correcting and testing the eye observations and of supplying absolute evidence of the planet's position and rate of transit at definite intervals. In an article contributed by "J. R. C." (presumably Mr. J. R. Capron) to the *Surrey Advertiser,* the writer gives a graphic account of the steps taken by him to observe the planet, should it appear. The observatory at Guildford was well supplied with refracting and reflecting telescopes, one of the former class being used for observing and one of the latter for photographing. The reflector had the eyepiece removed, and a small camera attached in its stead to receive the sun's image. To obtain satisfactory impressions of the objects visible upon, and that may cross, the disc the camera must only be allowed to "glance" at the sun; and, in order to effect this, drop shutters were placed immediately in front of the sensitive plate. These were made of zinc, and each had in it a fine slit cut horizontally. The plate was suspended in grooves by a wire support, and so arranged that on cutting the thread the shutter dropped down, and the only exposure the sensitive surface received was from the rapid passage in front of it of the slit in the shutter. The slits employed in the various shutters were the 1-50th, 1-40th, 1-30th, and 1-20th of an inch wide. In practice the 1-40th and 1-30th were found to be most applicable for the intended purpose, and with these sharp, direct images of the sun's disc rather more than two and a-quarter inches in diameter were obtained. The practical photographic operations were conducted by Mr. Murray, of the Surrey Photographic Company. Inside the camera were suspended a thread and small plummet; the shadow of the thread, being photographed at the same time as the sun, showed the true vertical position of the latter. All things being in readiness, and numerous photographic rehearsals having been made, attention was closely directed to the sun's disc during three days without discovering the small spot which would be distinguished from the ordinary sun spots by its intense blackness and its sharp and definite contour as compared with the ragged edges and less dense structure of the sun's spots. We recollect that at the meeting of the British Association at Brighton, in 1872, Dr. Warren De la Rue told us he had found dry collodion plates to be quite unsuited for the purpose of obtaining photographs of the sun, the alleged fault being the halation given—a fault from which, he said, plates prepared by the wet process were quite free. Mr. Capron's more recent experience in this direction is valuable. He eulogises strongly Kennett's pellicle plates as being exceedingly convenient, and giving a clean, clear, and bright image, quite free from the halation which was remarked to be present in the collodion wet plates, and which were also employed. Why this should be the case we are a little puzzled to explain, unless the gelatine plates had a very dense film.

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BLOOD POISONING BY ABSORPTION OF THE SOLUTION OF BICHROMATE OF POTASH THROUGH THE PORES.

Now that the subject of carbon printing is being so fully discussed it may be interesting to those engaged, or about to engage, in carbon work to read some experiences in poisoning with bichromate of potash taken into the system through the pores of the skin by immersing the hands in its solution.

It has not only been my misfortune to have suffered the greatest agony for weeks together, barely escaping death, but I have had the opportunity of carefully noting all the effects of such poisoning upon others as well as on my own constitution. Such extreme cases are, I grant, of rare occurrence; but, as all systems are liable to the action of the poison to some extent, the subject is well worthy of attention. The effects of bichromate when swallowed are quite different from those of which I am writing; and, as there is an abundance of information upon the former subject in print, I will confine myself to the blood poisoning simply.

The first symptoms of local poisoning are heat, itching, and tingling upon the ends and middle joints of the fingers, which, when examined, are found to be covered with minute, irregular, red patches, upon which are numerous small elevations clustered together. In the course of a day or so these enlarge to the size of a small bead, and are filled with a limpid fluid. In a short time these clusters run into each other, forming large blisters which dry and crack open, causing the most acute pain and itching; at this stage postules begin to form all over the body, mainly down the spine, on the neck, left side, arms, and ankles, accompanied with considerable constitutional affection, such as sickness, headache, thirst, fever, sleeplessness, and loss of appetite and senses.

In my own case, after the third day I became nearly blind; the whole mucous membrane became inflamed, accompanied by running and pain in the ears and throat. One case came to my notice in which the patient was covered with large patches possessing the appearance of having been eaten in with acid. This man lost his appetite completely, and suffered much pain in the intestines and bladder. He lost consciousness every few hours, and had to be continually watched and aroused. When apparently sensible he was so dejected in spirits that he tried several times to commit suicide.

The effect of this poisoning upon scrofulous and syphilitic persons, when it does affect them, takes a very troublesome and dangerous form, although, strange to say, such persons are not so susceptible as healthy subjects.

The treatment—perhaps owing to the rare occurrence of these cases—does not appear to be well understood. I sought advice from many able physicians abroad; there seemed, however, to be no reliable remedy but to allow Nature to take her course, aiding the cure by paying strict attention to diet and habits. The following treatment I have found very successful in every case:—

Abstain from drinking beer, spirits, or coffee, and eat no potatoes, brown meats, salt fish, or sugar. Take plenty of open-air exercise and use no tobacco. Take—One teaspoonful of liquor potassa in a cupful of barley water thrice daily, before meals, for five or six days; after which take three times daily of tincture of serpentary (American snake root) one drachm, laudanum five drops. The parts affected must be bathed frequently with dilute solution of sub-acetate of lead. The foregoing treatment is continued until the sickness and pain have subsided and the patches have lost the fluid they contained and begin to heal. The hands and arms are then bound with resin ointment, and the following is taken for about ten or twelve days:—

Ammonia-citrate of iron	120	grains.
Bromide of ammonia	½	ounce.
Iodide of potassium	20	grains.
Aqua camphora	12	ounces.

Take half-an-ounce twice daily and the following pill, two each night:—Extract of Indian hemp, to make twenty-four pills, one-third of a grain each.

In my own case I found the free use of fresh butter advantageous, but as I have not tried it with others I cannot recommend it.

It is generally believed that by washing the hands in ammonia after using bichromate it prevents the poison from entering the system by neutralising the acid; but this is quite a mistake, as a solution of bichromate rendered perfectly alkaline with ammonia poisons quicker, if anything, than an acid or neutral solution.

In conclusion: I trust I have not occupied so much valuable space to no purpose. This is a matter of the greatest importance to carbon workers; and, being the first time I have seen such a serious drawback to the use of bichromate mentioned, I hope my remarks may elicit further information from those who have had experience in this direction.

J. D. Colton.

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COMPARATIVE EXPERIMENTS WITH DRY PLATES.

[A communication to the Liverpool Amateur Photographic Association.]

A projected photographic jaunt among the peaks and passes of Switzerland in the course of the coming season, and the very laudable desire to bring home with me as perfect a batch of negatives as possible, have led me to experimentalise upon the different kinds of dry plates which were accessible to me, with a view to the final selection for work among the Alps of that process which would seem best adapted to supply me with the perfection I aim at.

My experiments in this direction proved so interesting to myself that I became impressed with the possibly erroneous notion that the detail of the results of my work might be of interest to others, and, indeed, useful, to some extent, as well. Accordingly, I determined to suggest them as a subject for discussion tonight, and without further apology will proceed to lay these results before you.

It will, of course, be clearly understood that in my remarks upon the various dry plates upon which I have been operating lately, I do not presume to say that this class of plate is necessarily faulty and that necessarily good; I merely wish, as a dry-plate worker of some years' experience, to state how these plates have behaved in my hands, and to give a few accurate data which may, I think, prove useful to others in their work.

The following are the plates whose sensitiveness and general capabilities I have been testing in my late experiments:—Coffee, gelatino-bromide with water, gelatino-bromide with beer, Liverpool rapid, London, collodio-albumen, uranium, and Warnerke's tissue. I have endeavoured to expose these, as far as possible, under precisely the same conditions of light, upon the same subject, in the same camera, and with the same lens and diaphragm. The development has, of course, been varied to suit the requirements of each kind of plate. I have used the formulæ prescribed by the several makers for their respective plates, and have in all respects endeavoured to deal fairly and impartially and to obtain the best results to be had.

The subject I selected was Wallasey Church; the lens was Dallmeyer's medium-angle rectilinear; the stop that numbered 4; and the light that of a misty sun, with the accompaniment, decidedly unfavourable to photography, of an east wind. The duration of exposure required by each plate was ascertained as accurately as possible by the plan of giving four exposures on a trial plate. Thus, for example, four slices of a uranium plate were exposed for five, ten, twenty, and thirty seconds respectively. The result proved that the portion of the plate exposed for ten seconds gave the greatest vigour under the developer, and this time was adopted accordingly. I have arranged some of the results in a tabular form, as follows:—

	Exposure.	Development.	Intensification.	Result.
Coffee.	320 seconds.	15 minutes.	To any extent.	Good.
Gelatine-beer.	20 seconds.	7 minutes.	Easy, but not required.	Very good.
Gelatine-water.	7 seconds.	6 minutes.	Difficult.	Thin.
Liverpool rapid.	50 seconds.	10 minutes.	Easy.	Very good.
London.	150 seconds.	9 minutes.	Easy.	Fair.
Pollitt.	480 seconds.	45 minutes.	Easy.	Very good.
Uranium.	7 seconds.	12 minutes.	Difficult.	Fair.
Warnerke's tissue.	60 seconds.	10 minutes.		Good.

The following, then, is the order of rapidity:—Uranium and gelatine-water (nearly the same, but slightly in favour of uranium, this plate showing signs of over-exposure), gelatino-beer, Liverpool, Warnerke's tissue, London, coffee, and, lastly, collodio-albumen.

The quickest to develope are the gelatine, the slowest the collodio-albumen, while the coffee plates preserve a safe medium. Gelatine pellicle plates made with water are, as a rule, very disinclined to intensification by acid silver, but acquire a slightly augmented density when treated with chloride of copper and subsequent alkaline pyro. On the other hand, gelatine-water plates made from an emulsion in which bromide of ammonium is employed will intensify readily. Gelatino-beer, Liverpool, London, Pollitt, and coffee plates will acquire any amount of density with acidulated silver; but the uranium, in my hands, obstinately declined intensification. My classification in order of excellence is as follows:— 1. Gelatino-beer. 2. Pollitt. 3. Coffee. 4. Liverpool. 5. Gelatine-water. 6. London. 7. Uranium.

The negatives themselves will enable those who please to do so to readjust the order of this classification. The gelatino-beer plates, in my (possibly unskilful) hands, have proved the only ones which produce anything like freedom from stains, spots, pinholes, striæ, &c., and, at the same time, may be depended upon with absolute certainty (provided they are guarded from damp), for a dense, brilliant, and printable negative. I have been unfortunate in my batches both of London and uranium plates; for I failed to find a single plate in either package which was free from defect in the structure of the films. I have never tested the London plates before; but I have often obtained the most perfect results from the old uranium plates. I do not appreciate the dense films of the latter as they doubtless deserve. They put an end, it is true, to all chance of blurring; but it seems to me that the advantage is gained at the expense of brilliancy.

The collodio-albumen and coffee plates give much the same character of picture, and that one of the greatest delicacy and beauty, combined with vigour and brilliancy. With regard to the former, however, although the resulting negatives are often perfection itself, there is the counterbalancing disadvantage of their exceeding sluggishness under the developer. To an amateur with, necessarily, very limited time at his disposal the undoubted truth of a new application of an old adage, "*Ars longa, vita brevis,*" comes home with a painful force when he faces, as I have done, at the close of a photographic "out," many dozens of exposed collodio-albumen plates, and all to be developed at the rate of forty minutes per plate.

My coffee specimen needs some apology. I was in a great hurry to produce it, and had no time to apply a substratum; hence the defects which are evident upon the film. I am, however, much pleased with these plates. I had never produced a coffee plate before; but with the aid of an old number of THE BRITISH JOURNAL OF PHOTOGRAPHY I obtained a successful batch at my first attempt. As the image appeared under the developer it was quite equal, with the exception of the pinholes, to the best of my gelatine friends. It was only on the slipping of the film, and in my efforts to save it from destruction, that the damage was done to the negative. The crop of pinholes manifest upon this and upon the collodio-albumen plates might, perhaps, have been avoided by the use of a new bath. In the collodio-emulsion plates I know not how to avoid them. But here comes in the manifest advantage of the gelatine process. There is absolute certainty with a gelatine emulsion that every plate in a batch will be precisely like to its fellows. This is not so with bath plates; nor is it the case with collodion emulsion. The bath may sicken of one or more of the many ills to which baths are liable in the very middle of the process of the preparation of a batch; and, as to emulsion, there is no doubt that evaporation produces a speedy difference in the consistency of the films, and therefore a difference in the character of the resulting negatives.

I have lately returned from a few days' camera work in Wales, and here I had an opportunity for testing plates of different kinds under the most unfavourable circumstances of light and weather. Liverpool plates gave me some beautiful results; but some of these split up into multitudinous fragments of film during drying. Gelatine also afforded me some excellent negatives, in spite of the most deplorably bad light. Blurring, however, set in to an unusual extent, and I shall never again venture to use these plates in the field without backing.

I am sorry that I have been unable to make or procure plates prepared by some of the other well-known processes. I hope, however, that what I have done and what I have said with reference to the few specimens before you may afford us a theme for an interesting and profitable discussion this evening. H. J. PALMER, M.A.

NOTES ON PASSING EVENTS.

BY A PERIPATETIC PHOTOGRAPHER.

ONE must be thankful for small mercies. The "high religious authorities" of the Mohammedan faith appear to have discovered some objection in principle which may apply to the reproduction of the Koran by means of type that does not apply to its being reproduced either by copyers in MS. or by photo-typographical means. One who, like the "Peripatetic Photographer," is without the Islamitish pale, may well be excused for expressing a certain degree of wonderment as to how a manuscript copy of any document can be superior, as respects accuracy, to a typographic set-off of the same. But on matters of religious belief the "Peripatetic Photographer" has never been known to enter in these pages; still, there is not a little in the recent decree of the "high religious authorities" in the East which from a purely reproductive point of view might bear being looked into with a view to ventilation. It is enough to know, in the meantime, that the original which was presented to the camera, with a view to its photo-typographical reproduction, will be faithfully copied quite irrespective of *its* being a faithful copy of some other work handed down by caligraphic means.

Has Mr. C. J. Witcomb obtained the sanction of the scientific authorities by whom such things are regulated in designating thermometrical degrees (*à la* Fahrenheit) as percentages? In a good and practical article on chromotype printing he says "begin at seventy per cent." Now, as 70° *Centigrade* is equal to 158° of Fahrenheit, any tyro in carbon printing can see that this degree of temperature was never dreamt of for water in which to immerse prints even as yet undeveloped. Besides, his whole argument is against the use of hot water. By seventy "per cent.," therefore, I presume, is meant seventy degrees Fahrenheit. Am I right, O Mr. Witcomb! and ye other men that belong in a special sense to this carboniferous era?

It is quite true, as Mr. John Parker observes, that we have not yet reached that stage in photographic progress where clouds and landscape can be satisfactorily rendered in the same negative; but I imagine that the mechanical appliances now placed at our command enable us to overcome, in a satisfactory manner, the inherent chemical difficulties. In 1847 I sat to a daguerreotypist for my portrait, and he covered up my shirt breast, with its beruffled front (for that was the period of "ruffles"), with a triangular strip of black velvet kept in readiness for the purpose. When the exposure was more than half over, after the injunction "don't move!" the velvet mask was cleverly removed and the exposure went on. What the frilled shirt front was thirty years ago the sky is now. A mask must be made use of to prevent the too great activity of luminous action. But if you shield the sky, in the interests of sombre trees in the middle distance, what will become of the Ben Nevises which rear their heads, great or small, up against the sky? or how can it be expected that the various spires or steeples of the numerous St. Pauls and St. Blanks, whose

> "Cloud-kissing turrets—spires that seem to kiss the clouds,"

persist in coming within ken of the eye of the camera, be adequately rendered in all their details? Here comes to our aid the ingenious device of Mr. W. M. Ayres, who, in your ALMANAC, has shown in what manner it is possible to adjust the shape of his movable mask to that of the subject which it is desirable should be masked. An adjustable landscape shield is a very excellent and useful piece of apparatus, and by its means the sky, with its fleecy clouds, may be equally as well represented as sombre terrestrial scenery. It is merely another mode of applying the velvet breast mask of the portrait photographer of thirty years ago; but of the superior mechanical ingenuity displayed in the modern sky mask there cannot be any doubt whatever.

On Saturday last, between Baron Cleasby and a special jury, a case was heard and adjudicated upon, in connection with which the Brighton Aquarium Company has been fined in the sum of £200 and costs for having kept that place of popular resort open on a certain Sunday. A large number of acts of parliament exist under which it may be possible to obtain verdicts against persons who choose to indulge in sundry methods of violation of Sunday observance. One of these acts has reference to those who shall publicly transact "secular business" on the Sunday. Now, how will such an act of parliament affect those photographers who keep their establishments open, and do a large amount of business, on Sundays? I should very much like to see this question tried on its merits in one of our metropolitan courts; for, as the matter stands at present, things in this direction are in an unsatisfactory state. A case which appeared in your columns, under the heading of "Photography in Court," many years ago, told the story of one professional photographer who was fined more than once on Monday for practising his art on Sunday, but who, on comparing his Sunday gains with his Monday losses, preferred to continue setting "law and order" at defiance until his "persecutors" got tired of prosecuting him further. If it be illegal to carry on one's business on Sunday it would be exceedingly desirable that the illegality of the act, as applied to photographers, should be clearly understood.

Happy is the City of Glasgow in possessing a magistrate who is not to be caught by chaff! In London it is not easy to go along any of our principal thoroughfares without having the eye and the sense of decency offended by the photographs one sees in the shop windows of dealers, in which we find shameless women figuring in their "counterfeit presentments" in a state of semi-nudity. These are dubbed actresses—"pretty actresses" some even label them up. But, without effecting any undue amount of "Platonicism," I do think that it would be better for public morals if we had amongst us in England some legal adjudicator who, like the Glasgow magistrate to whom I have alluded, would put the law in force and banish from our midst the indecent—at anyrate indelicate—portraits of the "frail sisterhood"—actresses though they be—whose photographs are to be seen adorning the shop windows of certain dealers in the same way that a putrescent sore "adorns" the surface of an otherwise healthy body. It is a scandal and a disgrace to witness the portraits of these semi-draped Cyprians forced upon public attention in our leading thoroughfares.

(To be continued.)

UPON WEAKENING, INTENSIFYING, AND TONING CARBON PICTURES.

[A communication to the Photographic Society of Vienna.]

The carbon process renders us important service in the multiplication and reversal of negatives, and also plays no unimportant part in the enlarging process. In each and all of these cases we use as negatives carbon pictures, which must possess a certain degree of strength and sharpness before they can furnish clean and perfect impressions. The proper density of the picture is, therefore, of especial importance here as well as in the case of the silver negative, and we shall make the attainment of it our aim.

Practically in carbon printing, especially when a great number of prints are being made, it may happen that the operator does not bestow sufficient care and attention upon the exposure of this picture or that, and, in consequence, some of the pictures may be printed too dark and others too light. As carbon printing proceeds much more rapidly than silver printing, it is easy to understand how it may happen that if one portion of a batch of prints have not been withdrawn soon enough from the action of the light, and so allowed to become dark, haste to avoid the same error may cause one to run to the opposite extreme and take the remainder into the dark room even before they have been sufficiently exposed. That the photometer is usually incorrectly and almost always differently read by different persons, and that the progress of the printing is not visible upon the tissue itself, are the gravest drawbacks with which the inexperienced beginner and the declared opponent of the carbon process can reproach it, or assign as their reason for abandoning it.

I admit that the reading off of the photometer in the way usually recommended by their inventors and makers is not convenient, and that no one could like the running in and out to and from the dark room with the photometer, and covering up the exposed pictures from time to time with black cloth or paper masks. Besides that, there are persons—amongst whom I reckon myself—who can scarcely distinguish the numbers on the silvered or bichromated paper of the photometer, and thus frequently misread them. I admit, further, that the invisibility of the progress of the printing of carbon tissue* is a great drawback to the carbon process, though not nearly so great as it appears at first. I read off the degrees of the photometer by observing certain precautions at the time of exposure, since daily practice has shown that the action of the light is not so instantaneous as that allowing it to act equally for a second upon the whole surface of the strip of paper in the photometer should have an injurious effect.†

The invisibility of the progress of the printing upon the carbon tissue, in conjunction with inattention on the part of the printer, are, therefore, the causes of the over- or under-exposure of carbon pictures. However, as far as this tolerably well-founded reproach is concerned, apologists of carbon photography tell us that the remedies are more numerous, more certain, and quicker than in the more generally-worked silver process. In the carbon picture the drawing appears as a more or less raised relief of coloured insoluble gelatine. The density of this drawing depends on the one hand upon the proportion of colouring matter contained in the pigmented film, and on the other hand upon the thickness of this film in the picture. With an equal exposure carbon tissue rich in colouring matter furnishes comparatively denser pictures than the slightly-coloured; therefore, the picture film of the carbon photograph produced by the latter tissue must be thicker than the former before its colouring can attain the same depth. Should the picture be too dark, then its picture film must be too thick and should be reduced. If the picture be too light, and therefore does not possess the requisite density, then the want of height in the relief must be supplied either by dusting-on colouring matter upon the picture film, by saturating it, or by chemical means through the use of various solutions. These are the general principles by which carbon pictures are weakened and intensified, and now we shall proceed to their special application.

The too much blackened or, to speak more correctly, the over-exposed carbon prints are washed in water of from 50° to 60° C., or left for some time in such water. The high temperature of the water produces a partial solution of the gelatine film, which was insoluble at a lower temperature, and thus produces a lightening of the picture. In developing in general, but more especially when weakening over-exposed pictures, care must be taken that the dissolved particles of coloured gelatine leave their place and fall to the bottom of the developing vessel without attaching themselves to any other part of the film by the way. In order to secure this it is advisable, when the paper has been removed, to place the transferring glass in the vessel upon three small leaden cubes, so that the adhering picture film is undermost. For developing large numbers of *cartes de visite* or cabinet pictures Herr K. Krziwanek has prepared from my directions developing-boxes of sheet zinc, having grooves at the sides to hold the pictures upright. These vessels require very little warm water, and in from five to ten minutes they wash perfectly clean, without any assistance, the carbon prints placed in them and left to their fate.

If the warm-water method of weakening over-exposed pictures appear unworkable, then some other means must be taken to attack and decompose the gelatine. Amongst the acids, muriatic acid may be mentioned as capable of being employed for this purpose; and amongst the alkalies, caustic soda, carbonate of soda, and ammonia. So, since one does not generally work very willingly with acids, we shall place the over-exposed pictures in a bath consisting of from one to two grammes of caustic soda and ten to twenty grammes of carbonate of soda mixed together in a litre of warm water. The pictures should be left in this soda bath until they have attained the required purity and lightness; but great care must be taken not to lose the delicate middle tints. Caustic soda attacks the gelatine film with great power, and if the picture should be left long enough in the bath it will eat out all the gelatine and leave the transfer empty. In the soda bath, as in the developing bath, the glasses with the adhering pictures should be laid film side downwards upon leaden cubes, so that the washing may proceed the more quickly, and that the white scum may be deposited upon the glass side and not on the picture side of the transfer glass. This white scum, caused by the carbonate of soda, is removed by the last washing.

It often happens that the picture is too powerful only in separate patches, but that it is properly printed with these exceptions. Such pictures may be treated by syringing the too dark portions with hot water or a weak solution of soda until they are equalised with the surrounding parts. For this purpose a common small ball syringe is the most suitable. The cause of this fault lies sometimes in the negative from which the picture is obtained, and sometimes in the insufficiency of the pressure of the negative upon the tissue in the printing-frame. In the latter case, increasing the pressure of the printing-frame will, of course, prevent the unequal printing; but if the cause be in the negative, the part that prints too quickly—such, for example, as the face—should be coated on the glass side of the negative with a solution of aniline red in alcohol. This procedure is generally to be recommended whenever the contrasts in the negative are too strong, or when there are stains from damp in the silver printing, if soft half-tones and reliefs are desired. In enlarging, the coating of the surface of the picture with aniline red is attended with great advantage.

If the picture be under-printed, one must first ascertain whether the middle tint is present in the most delicate details, or whether it is completely absent. In the latter case there is no means of replacing it either by dusting-on or solutions, as at the development its foundation, the gelatine, has been either wholly, or almost wholly, dissolved out. Such a picture could be best mended with a lead pencil or a brush; but, in my opinion, it had better be thrown away, with a view to economy of time.

If the picture be perfect in all its details, but does not possess the requisite depth, then intensification may be suitably taken advantage of, since, in proportion to its thickness, the gelatine film takes on coloured or colouring fluids, by means of which its actinic power and its visible density may be regulated.

If the carbon picture be intended to serve as a negative, then a colouring matter must be chosen for intensifying, which, either by its chemical properties or its power of covering, tends to absorb the rays of light; in all other cases one should rather choose those colours which will give the picture an agreeable, warm tone. Having in view the chemical properties of the colour demanded, the most suitable for the intensification of the carbon negative is a solution of permanganate of potassium (four to eight grammes to a litre of water), which in organic substances throws off the brown oxide of manganese and colours the picture olive-green.

At present this intensifier is the one exclusively used. In all the journals and handbooks nothing is advised for intensifying but permanganate of potassium, and it is almost exclusively used for that purpose. My as yet incomplete investigations of this department, on the contrary, have in view the providing of means of bestowing at will upon carbon pictures, after development and independently of the tissue, any desired colour or density.

Until now carbon photographs have been, in so far as the colour is concerned, entirely, and where the density is concerned partially, dependent upon the tissue, and the choice of sorts of paper is too limited to allow every individual to show his artistic taste by the selection of a particular shade, even if it were possible, as it is not, for the manufacturers of tissue to consult the individual taste of each customer. But as soon as the photographer is in a position to change and regulate at will, after development, the tone and density of the carbon picture, I think it perfectly justifiable that the individual taste of the photographer should be at liberty to gratify itself, as in silver printing, by choosing some method of toning such as those touched upon by Dr. van Monckhoven.

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* The progress of the printing upon white, light, or uncoloured paper is perfectly visible.

† For photometer strips ordinary paper coated with uncoloured gelatine should be used, and it should be sensitised at the same time and in the same bath as the carbon tissue with which it is to be used. If the photometer paper were sensitised in a *freshly*-made bath and the tissue in an *old* or a *different* bath, their printing power would be different, and the photometer would be of very little use.

The methods of intensification and the toning are, with few exceptions, so intimately conected that in the remainder of this paper I shall treat them all as intensifications, and divide them according to the fundamental reagents employed, as the *manganese*, *iron*, *lead*, *silver*, *cobalt*, *uranium*, and *nickel* methods of intensification, and conclude with remarks on the different colourings of the carbon pictures.

Karl von Stefanowski.

(To be continued.)

NOTES FROM THE NORTH.

As a rule I care to write only about such things as may be fully explained, having a decided aversion to secrets, secret processes, and process-mongers generally. Now and then, however, something will turn up of which it may be worth making an exception, and that of which I now wish to speak is, I think, an example.

When on a visit to Aberdeen, as recorded in my last batch of *Notes*, myself and companion visited a studio the existence of which was indicated by a case of specimens hanging on a wall. It stood in the middle of a kitchen garden, and from its general appearance did not lead us to expect much; but before leaving we had another illustration of the soundness of the oft-quoted advice, "don't judge by appearances," as we not only saw some good work, and got traces of a real advance in the method of working, but also received a lesson in patient, persevering, and successful determination to overcome difficulties that was worth a long journey to obtain. This latter, however, must remain over until another opportunity; suffice it, in the meantime, to say that the artist had, in the face of apparently the most insurmountable difficulties and under the most unfavourable circumstances, including the possession of but one leg and the use of but one arm, raised himself to a good position, and done work of a quality worthy of imitation.

On entering the studio we received a hearty welcome from Mr. Thomson, whom I recognised as having been a visitor at the late exhibition, and I not unnaturally concluded that there was more than at first met the eye in a man who would undertake the long journey from Aberdeen to Edinburgh to see what his neighbours were doing. After the usual conversation on things photographic, in reply to my question as to there being anything new, he told us that he had been both pleased and astonished with some experiments that he had seen made by a friend from Fraserburgh the previous day. After the ordinary business of the day was over, and when the light had so far gone that he should not have attempted to take a picture, his friend produced a bottle containing a creamy-looking fluid with which he coated a plate, and, after letting it set for a couple of minutes, placed it in the camera and took a picture with an exposure of just the same duration that had been given to the last wet collodion negative of the day, and *that* after the light had declined to such an extent that he did not think a wet negative could have been taken at all. On being shown the negative in question I saw that it was by a gelatine process, that it was fully exposed, capable of yielding a brilliant print, and perfectly free from fog or other objectionable quality. This was all the information that I could get, except that the discoverer had been experimenting with the process for several years, and that in his hands it was now so certain and sensitive that it had for many months been the only one used in his studio or the field. This, of course, was tantalising; but I consoled myself with the thought that if Mr. Thomson's estimate of the process was not over-drawn we should hear more about it in some other way, and so it has come about.

A few days ago I received an invitation to visit the studio of Mr. Truefit, Edinburgh, and on calling was introduced to Mr. Gray, of Fraserburgh, who happened to be the friend alluded to by Mr. Thomson, of Aberdeen. Gelatine emulsion is evidently Mr. Gray's hobby, and he rides it with much enthusiasm, but at the same time, I am bound to say, with apparently good reason.

Although I am aware of the articles on the process of Mr. Gray, and of the gelatine processes in general that have so recently appeared in this Journal, it may, perhaps, be desirable that I confine my observations to what I have myself seen.

The plates are prepared by simply pouring on and off the emulsion without warming the glass, and they may be used within two minutes after coating, or a stock sufficient for two or three days' work may be coated at once and used in the ordinary course of business. The development may be carried on as rapidly as by the ordinary solution of iron, although he is of opinion that a better result is got by giving a little longer time, and perfect printing density is obtained without any method of intensification; while fog is absolutely unknown or, as he says, impossible, and that, too, although no bromide or other restrainer is employed.

A number of negatives and prints from them lie before me while I write, and they fully bear out all that Mr. Gray claims for them; and if anything were wanted to prove how rapidly the image may be impressed we have it in the sharply-cut features and roguishly-expressive eyes of a pretty child—a portrait that would not disgrace either Mr. Ross or Mr. Faulkner.

The *modus operandi*, as I saw it carried out, was somewhat as follows:—The emulsion was contained in a four- or six-ounce, wide-mouthed bottle, over the mouth of which was tied a piece of fine muslin. I had not seen this dodge before, and thought it a very capital way of filtering. That the flow might not be impeded for want of air a small hole was drilled in the neck of the bottle, and the emulsion flowed quite readily both out to the plate and in again as it was drained from it. The bottle was placed in a dish of warm water for a few minutes, and then the plate coated in the usual way. When the plate had been allowed to drain for a few seconds, but before it had ceased to drop, it was turned in the opposite way, and the thick edge allowed to run back till the coating was quite uniform, which it readily became, and it was then laid quite level for two minutes, after which it might be set up on edge or stored in a box. The plate so prepared was then placed in the camera, and, having ascertained that an exposure of twenty seconds was required for a wet collodion negative, this plate got only fifteen seconds. On removal to the dark room the plate was covered with a three-grain solution of pyrogallic acid, which was poured off and on several times. To this was added a few drops of an extremely weak solution of ammonia, and the image, on its application, immediately began to appear, and continued to gain in both detail and density till the development was complete—a process which occupied from one to two minutes. After fixing in hyposulphite of soda and well washing, the negative was immersed for a short time in a solution of bichromate of potassium, and again washed and dried. Mr. Gray uses the latter solution with a view of hardening the film, but probably chrome alum would answer the purpose better. The film is very tough, and without a substratum adhered to the glass so firmly that it bore the full force of the tap with water at a high pressure, and when dry is quite hard enough to stand any amount of ordinary printing without varnish.

The Edinburgh Photographic Society has inaugurated the outdoor work of the season by an early and successful excursion, as will have been seen from the usual report in a former number. What I wish specially to notice is the fact that Edinburgh, hitherto the stronghold of the beer-and-albumen process, has been unable to resist the encroachment of the gradually-strengthening emulsion tide, and that, on the occasion referred to, instead of a few plates by that now popular process as a kind of tentative experiment, emulsion was the rule, and even the long-loved beer-and-albumen the exception. But there is still a screw loose somewhere, or our northern Sun treats us to but a stingy share of his favours. Several of the members having faith in the three or four minutes' exposure, or even shorter, which are said to give good results south of the Tweed, are mourning sadly over under-exposure, while others have been very successful in their efforts—notably the energetic and successful Secretary, who shows as a result of his six plates six as perfect negatives as I have ever seen, and that notwithstanding—or perhaps more correctly, as he puts it, in consequence of—exposures varying from fifteen to forty minutes, and that, too, with an emulsion adjusted so as to contain only the faintest trace of free bromide.

I have not yet had an opportunity of seeing all the work that was done, but, from what I have seen, I am constrained to say that success was pretty much in proportion to the length of the exposure given.

John Nicol, Ph.D.

PHOTOGRAPHY IN COLOURS.*

Special Cameras.—We may use, and I have myself used, a camera with three lenses acting simultaneously. The advantage of this apparatus—that is to say, the simultaneousness of the three luminous impressions—exists only for subjects susceptible of modifying themselves during an exposure rather prolonged; for example, for landscapes in which the effects of the light are changing. It is necessary to realise exactly that for simultaneousness the three lenses should be opened and shut at the same time, which is only possible by putting in unequal diaphragms, and according to the degree of activity of the luminous impressions upon each of the three sensible surfaces. The diaphragms which I used were formed of two slits disposed as a cross, so that I simply weakened the lighting. It is the effect of this kind of diaphragm, different to the circular diaphragm, which determines an equal lighting on all parts of the image, leaving on the proof where used the degradation of the light presented on the borders of the image formed by the lens without diaphragm, or slightly diaphragmed. The triple camera of which I have spoken can only be used properly when the model is placed at a certain distance; being nearer it has no relief. Outside of these two cases stereoscopic differences are produced from one proof to the other, and they would prevent the outlines of all the objects coinciding in the ultimate superposition of the monochromes; consequently the three lenses ought to be in principle as close together as possible, which compels us generally to be contented with proofs of reduced size.

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* Continued from page 199.

I will indicate in a supplementary portion of this *memoir* the principles upon which a triplicate camera should be constructed, furnishing at once a simultaneousness of the three exposures, lineal identity of three proofs, and the power of giving to them any dimension whatever.

I hasten to say, as much as it is required to seek simultaneousness in the proofs when two of the negatives require considerable exposure, so much it becomes of secondary importance in proportion that the negative of the green light and that of the orange light are obtained more rapidly. What matter if the three negatives of a heliochromic portrait are taken successively, and with a single lens, if the three additional operations do not notably exceed the time of an ordinary exposure? That is the reason, whilst indicating the apparatus as I have done—which allows, if necessary, the simultaneousness of the three luminous impressions—why I have adopted and propose principally the employment of a camera with one lens provided either with a multiplication slide, which will give successively the three proofs or three identical slides, of which each contains one of the three sensitive plates, and which act simply in substituting one for the other without loss of time.

4. *Mounting of the Coloured Glasses in the Photographic Apparatus.*—There are two ways of fixing the coloured glasses. They may be of the size of the sensitive plates, and then they must be mounted in special grooves in each of three frames, which should leave between each sensitive plate and the coloured glass with which it is assorted a space of about two millimetres; or the coloured glasses are reduced to the dimension and the circular form of the lens, and then each of them must be mounted in a ring of metal which is enclosed freely in the part of the tube of the lens between the lens and the outward extremity of the tube.

In the first of these two methods of mounting, the place occupied by the interposed coloured glass slightly changes the focus; it is, therefore, necessary that the same change takes place on the focussing glass used for focussing. With this object I adapt a frame carrier of the focussing glass, and in contact or nearly in contact with the focussing glass an uncoloured glass of a thickness equal to that of the coloured glass, adapted to each of the slides in question, which will occupy the place of this slide. It need not be said that the coloured glasses should not differ in thickness. The interval of about two millimetres between the coloured glass and the sensitive surface is, moreover, excellent for maintaining the plate humid in summer without the aid of hydroscopic preservatives, of which I have indicated the inconveniences. The advantage is so valuable that, if the second mode of mounting the coloured glasses by placing them on the exterior end of the tube of the lens be adopted, as I have done, I advise the adoption to each of the slides (always in proximity to the sensitive surface) not of a coloured glass, but an uncoloured glass, intended only to maintain in hot weather the humidity of the layer of collodion.

In respect of the second mode of mounting I have only one remark to make at present. It is this—that the place above indicated for the round coloured glasses is the only one suitable; we must be careful to avoid placing them in the part of the lens turned towards the sensitive plate.

5. *Manufacture of Three Sorts of Glass or Coloured Mediums.*—It is almost impossible in the best-stocked warehouses of coloured glass to find my three kinds of heliochromic glass uniting to the advantage of the exact shade of colour exemption from defects, such as bubbles, striæ, &c.; that is why I have been led to seek and I have found another means of producing the three coloured mediums. I employ coloured varnish spread on the glass, and which I am able to detach if required in the form of a pellicle.

The aniline colours dissolved in the white varnish of the house of Sœhnée (Paris, Rue de Files du Calvairs, 17), designated by the letter A, and a portion of the coloured varnishes ready prepared and furnished by that house, are susceptible of mixing with each other, and of giving a great variety of shades of perfect transparency. To obtain upon glass a regular layer of one of these varnishes it is good to cover it first with a layer of normal collodion prepared in this way:—Heat moderately, and apply it in the same way as the collodion; the coloured varnish, if necessary, made fluid as required by the addition of a little alcohol. Once the excess of liquid has altogether drained off, and before the layer has had time to cloud, the glass is moved to and fro at a certain height above, over a warmer, holding it perfectly horizontal, the coloured side upwards; thus dried the layer becomes completely transparent. If the colour obtained in this way has not the necessary intensity, or if it is desired to modify the shade by the superposition of another varnish, one must be careful not to put the second layer direct upon the first, as this latter would be in part taken off. Once the first layer is well consolidated we spread a moderately warm solution of gelatine (ten per cent.) like collodion, pouring off the excess, and letting the plate dry vertically. There remains only an imperceptible thickness of gelatine, which dries very quickly, and on which may be poured without accident the second layer of varnish; thus, alternately, gelatine and varnish, and as many layers may be superposed as may be desired, taking care to change the dripping corners of the plates.

In place of the glasses coloured by means of the above process we may reduce the coloured medium to the state of a simple pellicle. For that purpose we must first wax the glass, then spread the layer of collodion, then a layer of gelatine; treat this latter with a bath of alum, then with a bath of rain water, and, lastly, establish the alternate layers of varnish and gelatine. The whole will separate easily from the glass in the state of a pellicle when the edges are loosened with a knife.

I have no special explanation to make in the case where the coloured medium consists in a glass of the dimension of the sensitive surface placed in proximity to it; but if the system of coloured circular pieces is adopted I ought to give warning that simple glasses will not be sufficient. The image becomes troubled by the defect of the plane of the surfaces; glasses only will serve. Besides, as the layer of coloured varnish, however carefully applied, presents frequently lumps and undulations which might disturb more or less the image, I have conceived the following arrangement:—I procure two glasses, and if possible two glasses with faces rigorously parallel. I spread the coloured varnish on one of the faces of one of them or on one of the faces of both of them as one or two layers are necessary; then I shape the said glasses into discs; and, lastly, I cement them together, these two discs with Canada balsam imprisoning in this cement the layer or the two layers of coloured varnish. In this way the undulations and the streaks of the varnish are overcome; the whole is, like a disc of crystal, perfectly homogeneous. I can thus utilise the coloured glass of commerce; that is to say, by fixing it with the Canada balsam between two glasses, the whole being cut into rounds or discs.

6. *The Exact Shades of the Three Glasses or Coloured Mediums.*—(1). *Shade of the Green-coloured Glass.*—It should be such that the yellow objects—the green and the blue objects above all the yellow objects—are impressed strongly upon the negative. If the yellow objects do not give a strong impression the red monochrome which corresponds to this negative will contain in the corresponding parts a quantity of red, which even mediocre will make the yellow pass to orange in the superposition of the monochrome, whilst a notable quantity of red coming from a poor impression from blue objects will not alter the blue in the superposition in question—in other words, it requires less red to alter the yellow than to alter the blue; a shade of green which responds to the position thus defined may be obtained by a mixture of varnish called "maize yellow" and of a little Metternich green. In place of mixing the two varnishes they may be spread in two distinct layers, either superposed on the one and the other on the same side of a glass, or poured upon the two faces of the glass, or, if the discs are used, on the two faces which are cemented one against the other. Bromide collodion with aurine having by itself—that is to say, without interposition of the green medium—a sensibility nearly equal for the yellow and for the blue, but, on the contrary, much less sensibility for the green, it results that the shade of the green medium need not be very intense nor very precise to give the desired results, and that even in a certain number of cases—for example, in a portrait after nature, where the green colour will not be represented—the green medium may be suppressed with impunity; care must be taken then to increase the quantity of aurine.

(2). *Shade of the Orange Glass.*—It should be such that the red objects, the orange and yellow, imprint strongly on the negative. The employment of chlorophyle gives tolerable latitude for the shades in question; it may vary between the red and the yellow without producing in the impressions proportional changes. The margin left thus to the operator is necessary, because all the red objects or orange or yellow in nature emit abundantly the rays which correspond to the characteristic band of chlorophyle (which band is situated at the limit of the red and the orange); and on the other part a transparent coloured medium, which varies from red to yellow, allows the passage for that very reason in great abundance of all the rays in question, in such a way that one may say the orange glass in a parallel case has no other use than to intercept the rays the most photogenic—to stop, in other words, the blue and the violet objects from making their impressions. I obtain a very suitable orange shade by means of two layers of varnish—the one maize yellow, the other cochineal rose. The mixture of these two varnishes does not give as beautiful a colour as their optical superposition.

(3). *Shade of the Violet Glass: Suppression of this Glass.*—The shade of the violet medium should be such that the blue objects and the violet objects print strongly, which takes place if we use a blue-glass violet shade, or simply violet. The impressions in the two cases are the same on the wet bromide of silver, because these two glasses allow the actinic rays in either case to pass in great abundance. It will be asked why I have said nothing about printing red objects; should not their impression be also strongly marked, and should not there be made use of a violet glass drawing on the red? I will reply that that strong impression would be too much; in effect on one part the impression, little or not pronounced, of red objects on the violet-glass negative has no other result than to produce in the corresponding parts of the yellow monochrome an abundance of yellow, which by placing itself under the carmine in the superposition of the monochromes increases it from a slight violet tint to a veritable red. On the other part, if we use a violet-red glass, not only the red suffers impurity of tone, but the yellows of nature being of a yellow very compounded, which contains the red, will do evil in respect to the impression due to the red which they emit, and would be, in consequence, represented by much too bright a yellow on the yellow monochrome, and consequently on the heliochrome I obtain a violet glass of a suitable shade by a mixture of blue varnish and rose cochineal varnish. As the actinic rays—that is to say, the rays which act alone, or nearly alone, by white light on the wet bromide of silver—are precisely those which this glass lets pass in very great abundance, it is easy to understand that for the heliochromic negative in question one may, without inconvenience, if it is prepared in this manner, suppress the violet glass. That is what I have done in the last, without any appreciable modification being produced in the impressions.

(To be continued.)

FOREIGN NOTES AND NEWS.

The Action of Light as Distinguished from that of Air upon Potassic Iodide.—A Stretcher for a Circular Background.—A Photographic Tour in Morocco.—Alcohol in the Carbon Process.—The Porotype.—A Suggestion for Rendering Horny Tissue Usable Again.

It is well known that when a solution of potassic iodide is exposed to the action of light it gradually becomes yellow, owing to the iodine being set free. According to Vidan, light alone is the cause of this change, and the atmostpheric air takes no part in it. Others, however, amongst whom is Battandier, are of a different opinion; and the latter has performed the following experiments, an account of which is given in the *Zeitschriff d. Ost. Ap-Ver*, in order to support his views:—A ten-per-cent solution of iodide of potassium was divided into three parts, one of which was placed in the open air where the direct sunlight fell upon it; the second in the sunlight in a vacuum; and the third in the shade, but in the air. Only the first portion underwent a reduction; it became yellow, and in three days it was found to contain chloroform instead of iodine.

This experiment, repeated three several times, always gave the same result, and appeared to establish as a fact that the presence of air is necessary to the decomposition. In order to gain greater certainty, a second solution of potassic iodide was prepared and divided into seven portions:—No. 1 was placed in the air and sunlight; No. 2 was placed in the air and sunlight after being boiled; No. 3 was placed in the air and sunlight after a stream of pure carbonic acid had been passed through it; No. 4 was placed in the air and sunlight after the addition of a little chloride of barium; No. 5 was placed in the air and sunlight after the addition of a little caustic potash; No. 6 was placed in the sunlight and in an atmosphere acidified by the decomposition of calcic carbonate by acid in it; and No. 7 in the sun, but enclosed with pure carbonic acid gas.

In Nos. 4, 5, and 6 no visible decomposition took place; in No. 7, on the contrary, it set in after a lapse of about two hours, and then continued; in No. 3 there was little change; and in Nos. 1 and 2 even less.

From the foregoing it appears that sunlight in presence of carbonic acid is the real cause of the decomposition, which incontestably takes place when hydriodic acid is formed:—

$$KI, HO, CO_2 = KO + CO_2, HI.$$

The hydriodic acid then loses a part of its iodine, and this gives the fluid its yellow colour.

The following is a description taken from the *Archiv* of an arrangement for sketching circular backgrounds exhibited at a recent meeting of the German Photographic Society of New York:—It consists of a circular frame, the circumference of which is divided into sections, which are attached separately to the spokes, so that by turning a screw in the centre the circumference is enlarged in all directions until the background is stretched smooth and flat.

We understand that the Emperor of Germany has sent Captain Zembsch, of the German navy, on a special embassy to the Sultan of Morocco—an occasion that is to be made the most of for the exploration of that little-known country. Herr Remelé, whose views of the Lybian Desert are now well known, has accompanied the expedition in the capacity of photographer. The travellers are expected to return to Europe after a three months' tour.

Some months ago M. Leon Vidal suggested that the exposure required by carbon prints might be materially shortened if, before being developed, they were laid for a few minutes in an alcohol bath and then dried. This suggestion was followed up by M. Boivin, who made a series of experiments tending to show that many other advantages were to be gained by the employment of alcohol in the carbon process. Amongst the advantages claimed by M. Boivin for the alcohol bath, besides its making the prints more powerful, are that the paper dries much more quickly and that it protects the picture from contraction and granularity.

At Berlin Herr Grüneberger has been making some similar experiments, the results of which are presented in a leader in the *Mittheilungen*. On trying the effect of alcohol upon paper sensitised by a bichromate of potassium bath he found that the paper dried at about the same rate, but this he ascribed to the low temperature of the room. The paper, however, was much softer and more supple than that prepared in an aqueous bath, which he explains by supposing that the alcoholic bath dissolves less of the glycerine in the picture film than the aqueous bath does. This acquired suppleness is of itself an advantage and seems to be accompanied by a decrease of liability to reticulation and granularity.

A serious drawback is, however, found in the comparative insolubility of bichromate of potassium in water containing alcohol. This difficulty, as may remembered, M. Boivin gets over by substituting ammoniac bichromate for the potassic, as, though the former is less sensitive with water than the latter, it is more so with alcohol. This point Herr Grüneberger has not yet proved, though he promises to do so shortly and report on the results obtained.

Dr. Vogel says that an alcoholic bichromate of potassium bath is worthy of commendation, and when one wishes to get sensitised tissue that will dry rapidly he recommends the following procedure:—Half-an-hour after the tissue has been sensitised dip it for five minutes into a spirit bath of 90°; it will then dry in a few hours, so that it will be possible to fix and finish by four in the afternoon, and single transfer pictures made from tissue sensitised about ten o'clock in the forenoon.

According to current reports, "porotypography" is a new process for producing copies of copperplates, woodcuts, &c. It is said to rest upon the property possessed by paper which is porous, and easily allows gases to pass through it, to lose this porosity at certain places which are printed. A gas, which either colours or discolours a certain chemical substance, is passed through the imprinted parts of a copperplate etching, and on reaching the further side of the paper rests upon a second paper saturated with the given reagent. Where the gas found a passage through, the colour of the paper is changed, and an impression of the first print is produced.

Four papers are required, namely, one evolving the gas, saturated with bisulphate of soda; one sensitive to the gas, saturated first with extract of gall and then with a solution of ferrous sulphate; then blotting-paper and oil paper. The printing may be done by laying the papers between the leaves of a book and then adding a strong pressure. Lay the woodcut upon the sensitive paper, and upon the woodcut the gas-evolving paper; upon that lay a thin paper saturated in sulphuric acid and then dried; and upon that again oil paper. Press the whole together for ten minutes or so, after which the prints should be ready. Professor Böttger has, however, only got indistinct impressions by this means as yet.

In the *Photographische Correspondenz* Herr R. Jastrzembski suggests that the coating of plates for carbon printing with collodion, benzine, wax, &c., might be done away with, and the process very much simplified, if the manufacturers of the tissue would give the latter a final coating with collodion. He also says that when he had old tissue which had become horny, and consequently went into runnels when developing the prints, he could not, of course, save these pictures, but he saved the rest of the roll of tissue by giving it a coating of collodion, and he was surprised at the clean and beautiful prints he developed from it. During all the heat of summer his tissue kept in good condition.

With regard to the best way of coating the tissue, after many experiments Herr Jastrzembski thinks the following is the best:—He takes a piece of tissue the desired size (probably as large as he can manage), and fastens it down with clasps or pins flat and smooth upon a board, and then pours over it as upon a negative plate some collodion containing about one and a-half per cent. of pyroxyline. When the collodion has half stiffened he takes the paper off the board, and dips it quickly into a vessel containing water, and lets it lie there, moving the dish occasionally until all fatty streaks have disappeared; he then lays it upon a sloping board to dry. When perfectly dry this collodion coating may be brushed over with the well-known solution of wax in turpentine, but none of it will stick. Before the tissue is used the collodion coating must be allowed to become *perfectly dry*. It may be sensitised next day, or it may be kept unsensitised for an indefinite period.

MY STUDIO.

Operator No. 1.

I took to it as a speculation. I had no practical knowledge of the business, but, like many others, I fancied there was a lot of money in it; in fact, that it was pretty well all profit together—a popular fallacy. You never can tell the depth of the stream till you try it. A suitable business turned up; it was advertised in the market for sale on fair terms, and I purchased it. Now here stood I, possessor of the coveted prize which was to me the key whereby I could open the gates of wealth; but I must allow that there was a touch of the "white elephant" about it. I had no knowledge of the business, and I must find a good man to work it. "Oh, that's perfectly easy," said my friends; "pay a good price and you'll get a good man." So thought I myself—that is the way out of the wood. At once I tried it, and for some time with very questionable success.

I thought now a foreigner with a high-sounding name, backed up by fairly good work, will be the man to take with the public; and so I went in for it. A good name (for sound), and work equal to the name, is sure to float the barque all right.

His name was Gustave Königsberger—plenty of the alphabet for the money at any rate! He had been in the principal studios in Vienna and Brussels. For years he had manipulated in Paris; he had also managed some of the largest concerns in England; and, at considerable expense and inconvenience to himself, he came to me. Words, words, words!—but they sounded well, and I felt happy. I showed him the work that had been done in the place before, and, thinking it very creditable, I said so.

"Oh! it is nothing at all!" he exclaimed; I will produce pictures. These are not pictures. I do not pretend to be an artist—I am a photographer; and I can take a photograph. This, my dear sir, is nothing to what I will do" (and it was'nt). I was convinced that I had fallen in with the right man, and he, from his manner, had evidently fallen in with the right place.

When I visited the studio on the first morning Mr. K. said with a smile—"Oh! I am glad you have come, for these curtains will have to come down."—"Very well," I said.

"And we will have to put up new ones of a darker blue and no glaze; quite flat."—"Very well."

"And these black shutters will have to be painted blue."—"Well."

"And I will have to shut out all this top light with paper."—"Well."

"And I will have these top blinds to run on rods and not on wires; it is much more convenient."—"All right," I said, and left the studio.

On the second morning I walked up to see how the manager had got on with his alterations, when I was again hailed with—"Good morning, sir! Oh! I'm so glad you have come. You see I should like these backgrounds painted darker, and the light in this side of the studio blocked out altogether, and a place put here for an enlarging camera, and there is no use for these reflecting screens at all. I would have them cut down, and"—

"Stop a bit! stop a bit!" I said. "Now you know there have been pictures taken in this place, and in my poor judgment very good pictures too; now don't you think that it would be advisable to try what can be done before transforming the place in this wholesale way?"

"Oh! sir! I assure you that I do know what I want, and you shall see the pictures."

"Very well," I said, "have it done;" and I took my leave, thinking to myself he should know best. But I might as well have built a new place as have this one turned upside down in this way. However, he evidently knows what he is doing, and, though it may cost a little more, when he gets it all his own way we are sure to have good pictures at anyrate; and that was what I aimed at.

For a week or two Mr. K. toiled on with his alterations, until one morning he informed me the place was to his mind, and then he went into the making of baths and arranging of chemicals. I must own it was awfully wearisome to me; the child who waited the coming of the promised toy was nothing to it, and, after all, the first two or three days' work was very unsatisfactory. I asked the reason.

"I find," he said, with a shrug of his shoulders, "I have not yet got the light right; I will have to paint these shutters black, and"——

"But, bless me! you have just had the shutters painted blue."

"Well, you see I now find that blue is too light; in this question of light we have to find out."

"But why did'nt you try them before you altered them? It would certainly have been the cheaper way."

"I will tell you, sir: I have made your studio exactly the same as the one I worked in last, and now it will not produce the results. Why, I cannot tell; but I will tell you what I am going to do. I am going to make it the same as the one I worked in before, and it is sure to come right.

I felt quite angry. I saw in a moment how the matter stood; he knew nothing about light. He had never got beyond the mechanical contrivances used in the other studios in which he had worked. Without reflecting on the light there obtained and the light he had now at his command he went bungling on, so that at the best good pictures could but be the result of a mistake.

After thinking for a minute or two I said:—"Well, one thing I'll tell you; you have been labouring on here for a month evidently without knowing what you were doing, and the only result is a considerable outlay of money without any possible chance of return. So now, you can alter the house as much as you like, but I don't pay another penny—mind that."

Getting indignant he said—"I do not spend any money on your place that I can save you; but I will try what can be done for nothing."

I had him three months, but it was resitting after resitting, bath after bath, gross of plates after gross of plates, and he never produced a creditable picture. Thin, thin miserable things were all of them, for which he used matt varnish to bring up the whites; and they were brought up—no blooming error about that.

I am a tolerably patient man, but I got to be impatient at last, and I told Gustave we would have to part.

"With great regret I leave you," he said. "I like the place, and I am very sorry; you see I am a stranger."

"Oh" I said, with a sneer, "your name will carry you through." It was unkind, but I felt sore.

"What is in a name?" he said, with a shrug and an outspreading of his hands.

I did not reply to the question, and he went away. I had not yet come on the anticipated mine of wealth. I was not in the vein.

Murray Russell.

Meetings of Societies.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The monthly meeting of this Association was held on Thursday evening, the 26th ult., at the Free Library, William Brown-street,—the Rev. H. J. Palmer, President, in the chair.

The minutes of the previous meeting were read and passed, and Mr. W. E. Potter elected a member of the Association.

Mr. H. Houlgrave exhibited some negatives taken by Bolton's washed emulsion, on plates one and two years' old, showing no deterioration; also a gelatine plate prepared by King's formula.

The Secretary said he had written to Mr. L. Warnerke, who had kindly sent him some specimens of his tissue negatives. These he would pass round, and they would see what excellent results Mr. Warnerke was able to secure with his tissue. One or two, they would see, were of greater softness. These were on a new kind of tissue, which would shortly be in the market, and which was quite transparent without any application of collodion, as was previously necessary. One of the negatives had all the appearance of having been taken from the landscape direct, but it was merely a negative obtained by printing by superposition from a positive print obtained at a shop and exposed to gaslight for a minute, the long exposure overcoming the difference of texture in the paper print. Mr. Warnerke said he rarely now heard of failures in development, but if such happened it was invariably due to bad chemicals. Some times failures occurred in the inability to remove the film from the supporting paper. The cause was either that the tissue was not dried first, or that rubbing the back of the negative with turpentine had been omitted. Some failures were caused by not thoroughly fixing the negative, and this could be avoided by fixing in the light, as the mistake could be then seen at once. If the negative showed a want of brilliancy, the remedy was to begin the development by using at first a very small quantity of pyrogallic acid, and increasing it when necessary.

A hearty vote of thanks was passed to Mr. Warnerke for his kindness in allowing the members the pleasure of inspecting his excellent negatives.

Mr. J. A. Forrest then introduced to the meeting Mr. J. Valentine, of Dundee, who met with a most hearty reception. He (Mr. Forrest) handed round a series of pictures taken by Mr. Valentine for the use of artists, Mr. Valentine giving an interesting description of his method of working and producing them.

A letter was read from the Glasgow Photographic Association in reference to the question of carbon patents. It was considered, however, that the Association could not take any action in the matter.

The President then read a paper, *Comparative Experiments with Dry Plates.* [See page 208.] The paper was illustrated with a number of negatives and prints taken by the various processes.

A vote of thanks was passed to the President for his paper, and some discussion followed.

Mr. Forrest, in reference to the long development of collodio-albumen plates, recommended that a number of plates should be placed to soak in the pyrogallic developer for some time; they could then be more rapidly developed, using one dish for the silver in which to finish the plates singly.

It was decided to have an excursion to Shrewsbury, Haughmond Abbey, &c., on Wednesday, the 16th instant.

The meeting was shortly afterwards adjourned.

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VIENNA PHOTOGRAPHIC SOCIETY.

A meeting of this Society was held on the 6th March,—Dr. Hornig in the chair. A number of new members were admitted, after which,

Herr Luckhardt read an article from the *Philadelphia Photographer* by Mr. Gaffield on blue glass, and at the same time showed some negatives on glass plates, one half of each of which was left plain while the other was covered with violet varnish. As a rule the violet ends printed lighter than the plain, but in no case did they print darker.

The Chairman said that M. Schäffner, of Paris, whom he had asked to forward him a bottle of the violet varnish and a few metres of the stuff, assured him that M. Scotellari would only sell these articles to subscribers to his process.

Herr Karl von Stefanowski read a paper *Upon Weakening, Intensifying, and Toning Carbon Pictures.* [See page 210.]

Apropos of Herr Grüne's plate-cleaning machine,

Herr Luckhardt said that he had lately had a box made of moulded glass, having the sides grooved like a plate-box, in which he placed a number of plates in order to clean them by the action of acid.

The Chairman then read a communication from Herr Wehl, of Mainz, in which he recommended after-lighting as a means of shortening the exposure required, the exposure proper being given *with*, and the after-lighting *without*, a diaphragm.

Herr Luckhardt said that, sometime ago, MM. Gasc and Charconnet, of Paris, had produced a series of movable diaphragms which could be enlarged or reduced at will without shaking the lenses, and that might be useful if Herr Wehl's idea were carried into practice.

In answer to the question—"How can one prevent or cure the darkening of the retouch of positives and consequent spotty appearance caused by hot burnishing?"—

Herr **Luckhardt** replied that a good deal would depend on the nature of the colour employed for retouching, and also upon that of the gum or other binding medium.

There was no other business of interest, and the meeting was shortly afterwards adjourned.

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BERLIN PHOTOGRAPHIC SOCIETY.

A meeting of this Society was held on the 16th March,—Dr. Vogel in the chair. The proceedings were commenced by the admission of several new members. A delegate juryman for the Amsterdam photographic exhibition was then chosen.

Herr **Tiator**, of Colmar, rose and protested against the unfavourable report made by the committee on his retouching powder, showing several written testimonies to its excellence—notably one from a Danish dealer in photographic goods, Herr Jacobsen.

Herr **Prümm** could not see how they should be expected to modify an opinion based upon an independent experiment in consequence of any number of letters from dealers.

The President read a letter from Herr Dietrich, of Banda-Neira, in the Malaccas. This gentleman has been engaged lately in photographing in the wilds of New Guinea, and the President remarked he was probably the photographer who had penetrated the farthest east under the equator. In a passage of the above letter Herr Dietrich propounds a novel mode of defending one's self against the cannibals of the coast. He says:—"These cannibals are a very peculiar people, and the best way to get away from them with a whole skin is to marry one of them—the daughter of a chief is preferable (they are to be had at all prices); then, if one be not afraid of being eaten up by one's own wife, one has nothing to fear from the rest of the tribe, who will treat one as a friend whenever he returns to their country."

The President then showed some landscapes taken along the course of the Pacific railway and in Oregon by Mr. Watkins; and after the transaction of some local business the meeting was adjourned.

The annual general meeting of the same Society was held on the 6th April, when Dr. Vogel was re-elected president for the ensuing year. The treasurer, librarian, &c., presented their reports, and Herr Quidde, the Secretary, gave a sketch of the year's work.

Herr Reichard exhibited a number of cabinet portraits, showing the effect of Herr Klieppel's backgrounds, which were shown at the meeting of the 16th February. The effect was fairly good, but, as was expected, somewhat monotonous, and not as plastic as Seavey's.

Herr Hartwich, a painter, who was present as a guest, showed a number of sketches for backgrounds, in which, he said, he had endeavoured to embody Mr. Seavey's principles. They were all considered pretty good, but a few were especially admired, and a hope was expressed that Herr Hartwich might be able to give the effect equally well in the large size. On being asked what any of these backgrounds, according to sketch, would be likely to cost, he said about 60 marks (£3).

Herr **Prümm** thought that backgrounds, such as those used by Löescher and Petsch, in which the panels, pillars, cornices, &c., are not painted, but in actual relief, must stand out in better relief than when they are merely painted. Yet he would admit that in some of the American pictures with Seavey's backgrounds it would be difficult to tell whether the backgrounds were in relief or not. But then, on the other hand, some photographic studios, with their hollow rocks, &c., resembled rather too much the side scenes of a theatre.

Herr **Schaarwächter** said that these backgrounds were only useful for whole-length portraits either of the sitting or standing figure, seldom for half-lengths, and never for heads.

The discussion was continued in this strain for some time, after which,

The President read a letter from a provincial member, in which the latter complained that he had bought a new glass house where he could not take portraits of persons wearing white or light-coloured dresses, as the white cast a destroying glare over every part of the plate. Persons dressed entirely in black took very well. He could not blame his apparatus, as it was the same which had worked well at his old studio.

Herr **Halwas** remarked that in November he had to contend with a similar fault—a sort of fogging. Its nature was chemical, however, and an addition of tincture of iodine to the collodion removed it.

Herr **Quidde** did not think that in the present case the fault was of a chemical nature; he rather thought it was caused by the lighting of the glass house, though, of course, they would need to know more about the latter before they could express any definite opinion. Possibly some superfluous top or front light found its way into the lens.

Herr **Prümm** observed that the lens should always be protected by a cardboard tunnel, or a screen, from front light or top light. He had often seen that portraits of persons who wore spectacles were fogged in consequence of the reflection of light from the glasses. He therefore recommended that a pair of spectacle frames without the glass should be kept for persons who usually wore spectacles to put on while having their portraits taken, for if they did away with them altogether the portraits might have an unfamiliar air.

The meeting then proceeded to the election of officers, the reading of reports, and other local business, after which it was adjourned.

Correspondence.

TILTING THE CAMERA.

To the Editors.

Gentlemen,—I find, in the last number of The British Journal of Photography, Mr. Baynham Jones has made an objection, on theoretical and practical grounds, to the method proposed by me in your issue of the 30th ult., of adapting a swing front to a Kinnear camera, and cautions your readers against adopting the principle I advise, thereby avoiding needless expense and disappointment.

Now, all I have to say on the subject is that I regard the so-called "looking-glass" principle of swinging either front, lens, or back as correct in theory as it is perfect in practice, and from the time of Shadbolt to the present date all the best forms of swinging apparatus have been constructed upon it.

Evidently Mr. Baynham Jones does not regard with favour any form of swinging arrangement; for, although the parent of "a swing back which can be detached from the camera," he seems only too glad to get rid of his offspring on every possible occasion, as he writes:—"Comparatively few cameras have swing backs, and those which have are so much increased in size and weight that they are a great annoyance to the unfortunate individuals who have to carry them, and this is felt so much because they are not made use of for one picture in a hundred, and, therefore, it will be a great boon to landscape photographers to be able to leave them at home when they are in quest of subjects where they will not be required."

As a landscape photographer I should as soon think of leaving my head at home as discarding my swing back, when starting on "a tour in search of the picturesque." Without its aid how can we obtain crispness of detail in the foreground associated with perfect and satisfactory definition in the middle distance? Again: we may desire to take a view from a mountain height, looking down a deep gorge into a valley hundreds of yards beneath. Without a swinging arrangement of some kind it cannot be done (and one grave defect of the "hinged front" principle is that it does not permit of the lens being *lowered* when swung forward for foreground effects). One could multiply instances readily, but I will not occupy more of your valuable space, but assure your readers that the plan of conversion I advocate entails little or no expense (indeed, may be readily effected by any amateur possessing only moderate mechanical capabilities), adds little or nothing to the weight of the camera, and is "*always there*" when wanted.—I am, yours, &c.,

April 26, 1877. Syntax.

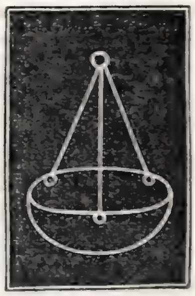
◆

SKY-SHUTTER.

To the Editors.

Gentlemen,—A friend has suggested to me that a bag to carry the pendulum weight of the shutter described last week would be more convenient to carry than the clip.

I have taken the hint, and have substituted a bag, made by cutting an india-rubber ball in half, putting in eyelets at three points of the edge, and suspending by three strings from a ring, like a scale pan, thus—



Another improvement in the fixing of the shutter rods is, in place of the back strip of wood, to fix in the same way a slip of thin spring-brass, curved like a bow, with the convex side pressing against the rods. This keeps them more steadily fixed in any position than the wood, which may shrink or warp.—I am, yours, &c., G. S. Penny.

Cheltenham, April 27, 1877.

◆

THE CARBON PROCESS.

To the Editors.

Gentlemen,—Having stated in your columns that, according to my views, the Lambertype tissue and the ordinary tissue were the same article I proposed in my last that an independent and unprejudiced person should examine them. The Autotype Company refuse the challenge—for the best of all reasons: as I said in my last, they know the result. So do I. I have received an immense number of samples of tissue and letters corroborating my statements from every part of England.

The Autotype Company are very free in their charges of mendacity and dishonourable conduct. For twenty years I have written in this and contemporary journals published in every country where photography exists as a high art, and no man has ever before used such words to me. Such phrases recoil on the user.—I am, yours, &c.,

Surbiton, April 30, 1877. SAMUEL FRY.

[Has not sufficient now been said upon this phase of the subject of carbon printing?—EDS.]

SHORTENING EXPOSURES.

To the EDITORS.

GENTLEMEN,—In *Foreign Notes and News*, in your last issue, the mode of shortening exposure by using a stop for a portion of the time and removing it for the remainder is brought out again. It has been known in this country, and has been in practice, more or less, ever since 1873.

You may remember, or may refer to, a letter of mine (dated May 2, 1873) proposing this very system. I there said that the Waterhouse diaphragm was particularly convenient for use in this way. I have often used it since, and never found that, with steady hand and camera-stand, there was any fear of shaking the camera in the operation.

Probably the table of relative exposures, worked out by Herr Wehl further than I have done, may be useful as some guide to those adopting the plan.—I am, yours, &c., G. S. PENNY.

Cheltenham, May 1, 1877.

EXCHANGE COLUMN.

THE BRITISH JOURNAL OF PHOTOGRAPHY complete, unbound, for the years 1872-3-4-5-6, in exchange for a Ross's B doublet for 5 × 4 plates.—Address, Captain GUBBINS, R.A., The Oaks, Leamington.

ANSWERS TO CORRESPONDENTS.

PHOTOGRAPHS REGISTERED—

Patterson and James, Ramsey, Isle of Man.—*Two views of Ballure Bridge.*

Thomas Forrest, Pontypridd.—*Seven groups of G. Thomas, I. Pride, and A. Dodd, miners; and one group of T. Ash, C. Parsons, W. Parsons, D. Owen, and J. Hughes, miners.*

☞ *Correspondents should never write on both sides of the paper.*

NOTICE.—Each correspondent is required to enclose his name and address although not necessarily for publication. Communications may, when thought desirable, appear under a *nom de plume* as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

R. P.—Please repeat your queries.

RICHARD HORTON.—Methylated ether will answer quite well.

INQUIRER.—1. We do not use a salt of platinum for enlarging.—2. The information required will be found at page 265 of our twenty-second volume.

G. J. THORPE.—The preparation of chloro-platinate of potassium is at present known only to those who hold the patent for the platina printing process, to whom you must apply for license and materials.

S. B. B.—You may obtain metallic silver from the chloride by acidulating the latter with sulphuric acid and then inserting a strip of zinc. Or it may be dissolved in ammonia and then treated with zinc, in which case decomposition commences immediately, and proceeds with great rapidity.

P. M.—We recognise the lens from your carefully-worded description. It is made by Lerebours. There is both an advantage and a disadvantage in having the diaphragm close to the front lens—an advantage in respect of superior flatness of field; and a disadvantage in the circle of illumination being less when placed in this position than if it were midway between the lenses.

G. B. LIDDLE.—The elimination of the hyposulphite of soda from the prints is neither the difficult or impossible matter which you imagine it to be. Wash for a few hours *properly*, and if you then test the print it will be difficult, if not impossible, to discover any traces of the presence of the salt. By making use of homœopathic quantities of chlorine or peroxide of hydrogen elimination will further be secured.

SIMON.—When blisters make their appearance in the collodio-albumen process you may assume that the collodion is unsuitable for the purpose. With a new and tough collodion we have frequently got blisters to a most annoying extent; but a cure was invariably effected when we added to the new collodion a large proportion of an old and very porous sample which we had long kept for this purpose.

R. SMITH.—To clean the old glasses apply a little nitric acid to the surfaces, sprinkle them with rotten-stone and rouge, apply friction, and finally wash in clean water. While they are still wet coat one side with albumen diluted with twenty times its volume of water, or about the white of one egg to a pint. Plates prepared in this way will be quite ready, when dry, to receive the coating of collodion emulsion.

S. S. HAMBLY.—We believe that the excise expect a formal request to be made for permission to use a still even for distilling water, it being illegal to keep a still for any purpose whatsoever without permission being sought and obtained to do so. A note addressed to the proper quarter will ensure your receiving the requisite permission.

JAS. ROBERTS.—The broad rule for determining the strength of the fixing bath is summarily comprehended in the following:—A paper that has been weakly salted will contain more chloride of silver than one in which there is a greater proportion of salt, and the latter will necessitate the use of a stronger solution of hyposulphite of soda than the former. Twelve pounds of hyposulphite will fix about two thousand *cartes.*

J. H. BAKER.—There is something the matter either with the lens or the ground glass. A small stop placed at *each end* of the portrait combination would produce the effect described; so also would a long projecting tube in front of the lens. You will know whether such obstructions exist. It is, on the other hand, possible that the peculiar effect observed is owing to the too great transparency of the ground glass. There is evidently something more requiring explanation than what you have given.

AMATEUR.—Paper such as you require in the production of enlargements is not kept in stock by any dealer, you will, therefore, have to prepare it yourself. The proper proportion of acid to add to the silver bath will have been reached when, upon developing the image, the high lights retain their purity. If they darken or become dingy it is an indication that the acid present is insufficient. The quantity of gas required will depend upon the preparation of the paper, the amount of enlargement, and the nature of the negative and lens; hence this must be ascertained by experiment.

GEO. F. MASKELYNE.—On the question of the comparative merits of reflectors and refractors for telescopes we cannot enter, there being special features incident to each. In photography the preponderance of advantages is undoubtedly to be found in refractors. A very large volume of light can very easily be "caught" by a reflector, and an excellent image of a distant object brought to a focus, but that image will only be sharp in one spot; and under such circumstances it would only occupy a plate of such ridiculously small dimensions as to be practically worthless. However, as you properly observe, there will be no *chromatic* aberration.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The next meeting of this Society will take place on Tuesday next, the 8th inst., at 5a, Pall Mall East (the summer exhibition of the Society of Painters in Water Colours being on view), when the discussion on the *Nitrate Silver Bath*, introduced by Mr. John Spiller, F.C.S., will be resumed. Also, a paper will be read by Capt. Abney, R.E., F.R.S.

ARTISTIC SPECIMENS.—Through Mr. J. A. Spencer we have been favoured by M. Boissonnas, of Geneva, with several specimens of the charming instantaneous portraits of children which he is enabled to produce in such a satisfactory manner by his modified quick collodion process. We learn that in the course of the present month the process is to be divulged under certain conditions, of which we are not yet made aware.

ROYAL CORNWALL POLYTECHNIC SOCIETY.—We have received the prize list for 1877 of this Society, from which we perceive that, as in past years, a number of medals in silver and bronze are offered for the best photographic productions. All work that has been elaborately retouched either on the negative or print will be excluded from competition. The exhibition will be opened on August 28th, and all articles intended for exhibition must be delivered at the Polytechnic Hall, Falmouth, one week before the opening.

PHOTOGRAPHY AND TOTAL ABSTINENCE.—At the annual meeting of the Baptist Total Abstinence Association, last week, in London, the Rev. G. W. McCree related an amusing story anent the experiences of a West-end photographer. He (the speaker) went to have his likeness taken, and after feeling his head the photographer remarked, "You are a teetotaller, sir." "Yes, I am; but why do you ask?" "Because we never fix the heads of teetotallers. Our experience is that moderate drinkers need their heads fixed, but that the heads of total abstainers are always sufficiently steady without any support." This was a scientific deduction from a long series of observations, and he took that to be a valuable testimony in favour of total abstinence.

METEOROLOGICAL REPORT.

Observations taken at 406, Strand, by J. H. STEWARD, Optician.

For the Week ending May 2, 1877.

THESE OBSERVATIONS ARE TAKEN AT 8 A.M.

April.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks.
26	29·99	E	41	45	50	39	Dull
27	29·91	E	43	47	51	40	Dull
28	29·73	E	42	47	50	42	Dull
30	30·09	NE	42	45	53	42	Dull
May.							
1	30·37	NE	39	43	48	38	Dull
2	30·34	NNE	38	44	—	40	Dull

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 888. Vol. XXIV.—MAY 11, 1877.

M. CHARDON'S METHOD OF DEVELOPMENT.

It now only remains to describe the behaviour of the Chardon plates and the modified form of development which the author of the process considers the best suited to them. It will have been noticed, from the short account given of the process by our Paris correspondent, that M. Chardon makes use of a somewhat novel form of development, utilising the advantages to be derived from the addition of organic matter to the alkaline pyro. in the manner which has recently been discussed in our columns, and also substituting a fixed alkali for the ammonia during the intensification, or second stage of the operation.

It is needless here to enlarge upon what has already been said by Mr. Brooks and ourselves upon the subject of organic and other additions to the ordinary alkaline developer beyond remarking that M. Chardon is, perhaps, the first to recommend such addition with the object of securing density solely; and, moreover, with that object in view, it is possible that glucose (the substance he employs) is specially adapted to the purpose on account of its well-known action in reducing silver from its solutions. Certainly it may be said that with the alkaline development we have no silver in solution; but it is not improbable that the same power which brings about reduction in the one case may augment the reducing action of the alkaline pyro. in the other. At anyrate it may be noted as a fact that the stains caused by the alkaline pyro. are much denser, as well as more metallic, in character when glucose is used, resembling very closely the deposit formed by pyro. and silver.

With regard to the substitution of bicarbonate of potash for the carbonate of ammonia in intensifying we presume the intention is to secure the power of employing a strongly-alkaline solution without the danger arising from the solvent action of an uncertain quality of free ammonia; but we doubt whether much, if any, advantage is thus obtained, for the developing action of the potash salt is greatly inferior to ammonia. It is true a more stable developer is secured, and possibly in the presence of glucose the loss of power may not be of importance; of this, however, our readers will be able to judge later.

The formulæ given at page 178 are the same as now recommended by M. Chardon with two exceptions;—In No. 1 solution, consisting of carbonate of ammonia and bromide of potassium, an error occurs in the quantity of the latter, which should be 0·40 grammes instead of forty, as there stated. The glucose solution is also changed to—

Water	75	grammes.
Alcohol	25	,,
Glucose	10	,,

It will be more convenient to many of our readers if we adapt the formulæ to our English measures; we therefore annex the altered solutions, and in speaking of our own operations shall give the quantities actually employed, which adhere as closely as possible to M. Chardon's proportions. We must also state that the developing instructions supplied to us by Mr. W. Harrison differ slightly from those given at page 178, and comprise the latest improvements upon the original formulæ handed in to the commission. The following will be the solutions required:—

No. 1.

Water	5 ounces.
Carbonate of ammonia	50 grains.
Bromide of potassium	1 grain.

No. 2.

Pyrogallic acid	50 grains.
Alcohol	1 ounce.

No. 3.

Water	1 ounce.
Bromide of potassium	5 grains.

No. 4.

A saturated aqueous solution of bicarbonate of potash.

No. 5.

Water	3 ounces.
Alcohol	1 ounce.
Glucose	200 grains.

The plate, after moistening with dilute alcohol, is well washed and placed in a dish containing the necessary quantity of No. 1, to each ounce of which is added twelve minims of No. 2. When the details are faintly visible add, for each ounce, twenty-four minims of the remaining three solutions, Nos. 3, 4, and 5, when any degree of density may be obtained, even to complete opacity.

Such are the instructions we have received, but in practice we do not find the result to be as stated. In the first place, the primary image is so extremely faint that we have found it absolutely impossible to judge when the development has proceeded far enough, and have with a properly-exposed plate almost invariably carried it too far. Such, at least, would appear to be the case; for, upon proceeding to intensify, the image has been incapable of withstanding the action of the solution without fogging, and, consequently, intensification has been practically impossible. With another emulsion prepared according to M. Chardon's formula, but with precipitated cotton of our own preparation, a more vigorous image is obtained, and we are thus enabled to watch the appearance of the picture and arrest the action at the proper point; but still the results are not what we could desire, the negatives being flat and heavy. We experienced no difficulty in attaining any density necessary for landscape purposes; but the general effect was that of an insufficiently-restrained developer. This led us to try the addition of a large proportion of bromide, but with very little advantage. We next *weakened* the developer considerably, and here the real solution of the difficulty was attained. After one or two attempts we found that by reducing the strength of No. 1 to one quarter and the quantity of No. 2 to four or five drops per ounce a perfectly successful development resulted. The image developed more vigorously, as is found to be the case with some emulsions when a feeble developer is used to commence with, and upon the addition of Nos. 3, 4, and 5, together with fresh pyro., gained strength rapidly and showed no tendency to fog or heaviness.

The Chardon plates were, however, still slightly faulty, being difficult to intensify without a slight fog, and the colour of the deposit was invariably of an unpleasantly cold blue tone. We were unable to account for this behaviour for some time, the most palpable cause being the unsuitable nature of the pyroxyline; this view, however, seemed untenable, as we had used M. Chardon's own cotton. An apparently trivial deviation from M. Chardon's formula in preparing our own emulsion may, however, throw some light upon the improved results obtained therewith—the excess of silver was neutralised with *bromide* of cadmium instead of with chloride of cobalt. Now, chloride of silver when present in emulsion is known to produce a tendency to fog, owing to its easy reduction by alkaline pyro. even without exposure to light; and it is possible that, in spite of the greatest care in preparing the compound bromide, as described by M. Chardon, we may have had too large an excess of free silver to convert into chloride, and hence the difficulty. We purpose testing the matter practically with the remaining portion of cotton, but in any case it seems to us desirable to dispense with the chloride. Except in the presence of restraining acid its addition to an emulsion, at least in our hands, invariably produces an unsatisfactory result; and it was for this reason that we deviated from M. Chardon's formula in the independent experiment with precipitated cotton of our own preparation.

As regards the action of glucose we are inclined, upon the short experience we have had with it as an intensifier, to speak favourably of it. The density is obtained with greater rapidity, and the character of the deposit and the gradations of the picture are better than when the intensification is performed by the addition of alkali alone. We are still, however, in favour of a finishing application of acid silver, a crispness being thus obtained which alkaline intensification, except under favourable circumstances, fails to produce. The use of bicarbonate of potash we do not yet find to be of any advantage, but rather the contrary, and we prefer to adhere to ammonia.

In conclusion: we must repeat what we have said previously, that the pith of the process lies in the use of precipitated cotton; and it rests with photographers to weigh for themselves the advantages on the one side and the additional cost on the other. Not the least advantage is the simplification of the preparation of the "pellicle" (so we must still call it, in lieu of a better name), by dispensing with the somewhat lengthy washing and drying usually adopted. The use of this description of pyroxyline appears to remove the uncertainty which attaches to Mr. M. Carey Lea's process, which is somewhat similar in character; for we have prepared upwards of a dozen emulsions under the most varying conditions with precipitated cotton without a single failure, whereas with Mr. Lea's method, for some reason or other, failure is the rule. It may be as well to note here that M. Chardon's mode of precipitating the emulsion is quite distinct from that of Mr. Lea, who definitely directs that the water (or organifier) be poured into the emulsion, while M. Chardon pours the emulsion into the water. The latter method was spoken of by Mr. Stillman some time ago as entailing with ordinary cotton a loss of over thirty per cent. We shall have something to say shortly on the preparation of precipitated cotton, and its behaviour in various processes.

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DIAPHRAGMS AND THEIR POWERS.

The subject of producing certain effects—this time the shortening of exposure—by means of changing the working aperture of the lens during the exposure of the plate in the camera, has once more assumed considerable importance.

The power of the diaphragm, although well known, is, perhaps, not so much so as it should be. By its means a picture can be made either well defined or "fuzzy"—either a veritable transcript of the scene to be depicted or a distorted mass suggestive only of that scene. The photographer is frequently ignorant of the power of the agent he employs until, when its force having been wrongfully applied, he becomes alive to the untoward consequences that ensue. It is matter both for congratulation and regret that the state of practical photographic optics is such as it is—for congratulation, inasmuch as owing to the excellence of the instruments supplied to him the photographer is enabled to direct all his skill into other channels; and for regret, because owing to this very excellence he is under no special necessity for directing his attention to a phase of our art-science which is exceedingly attractive.

The diaphragm is a power for good and also, although in a very minor degree, for evil; and, keeping in view what has recently appeared in the pages of this Journal concerning its efficacy in shortening exposure, we shall make a few observations on the subject which, although trite to the well-informed optician, may to the ordinary photographer convey some useful information.

Apropos of the suggestion, so recently published, that a certain duration of exposure with a small diaphragm (to bring out details) may advantageously be followed by a further exposure with a large diaphragm (to illuminate these details), so as to secure printing intensity in the negative, a friend informs us that, in photographing a corridor in which were a number of dimly-lighted statues, he adopted the method suggested, with this unexpected result—the objects towards the margins of the picture were duplicated. Bearing this possibility in mind, we proceed to make some observations on the functions of diaphragms.

The position in which a diaphragm is placed will determine to a great extent the nature and degree of distortion. For example: if the diaphragm be placed pretty close up against a landscape lens, such lens may, with the stop in this position, be used for architectural purposes if only a medium angle of view be included, subject, however, to this defect—that the margin of the picture will be deficient in sharpness. It must not be imagined that we claim on behalf of a lens used under such circumstances that it will give pictures quite free from curvilinear distortion. No such thing. All we mean is that in these pictures the distortion will be reduced to such an extent that its presence will scarcely be perceived unless a large angle of view be included.

The position of a diaphragm with relation to the axis of the lens will produce a variation in the position of the image on the sensitive plate on the ground glass of the camera. To establish this fact to the satisfaction of the observer let him have an arrangement made by which he can place the stop close up to the lens, its aperture being opposite the centre. Now let a picture be taken, and the aperture in the stop shifted nearer to one side of the lens, another picture being then taken. A careful comparison of the two will show the amount of displacement of the images that has taken place. The most satisfactory result, however, will be obtained if only one half the requisite exposure be given to the picture when the stop is in the former position, the remaining half being given on the *same* plate, after the position of the diaphragm has been altered, the camera, slide, and subject being quite immovable all the time.

What takes place on such a well-marked scale in the case mentioned will also take place on a smaller scale when one half of the exposure is given with a small diaphragm, and the remainder with one of large dimensions. This, however, does not apply to lenses of every class; but it certainly does apply to some kinds. Even with an objective of the most perfect form care must be taken that the stop which is inserted to succeed that by which the first exposure was given be centered most precisely; for if it fit loosely, and the centre of the aperture be at variance with that of the former one, displacement of the image will ensue.

◆

We have recently had two important additions made to our stock of intensifying processes which offer facilities not possessed by other similar methods. Though chiefly valuable in the production of extreme density in negatives without half-tone for photolithographic and phototypographic processes, both the lead method of Herren Eder and Tóth and the bromide of copper process more recently brought into notice by Captain Abney and Mr. Warnerke afford a means of strengthening extremely weak and otherwise useless negatives in half-tone by the addition of silver in the exact ratio in which it is present in the feeble image already formed. There are numerous plans in existence by which such weak images may be made to acquire very considerable density; but the increased strength in such cases is almost invariably due to the formation of some non-actinic compound of an unstable nature, while the effect produced is of an unsatisfactory character, owing to the fact that the parts already densest acquire an additional strength out of all proportion to the feeble details, which require such reinforcement in a greater degree. Unfortunately, also, any attempt at strengthening these images by redevelopment with silver entails such an amount of fog as to entirely counterbalance any advantage on the score of density. By means, however, of the two methods we have mentioned the amount of silver contained in the feeble image may be increased by a purely chemical process, in which the action of the light and developing power take no part whatever, the result being that each atom of silver forming the image attracts a certain and uniform proportion of additional metal, which may, if necessary, be reconverted into a form susceptible of further development to any required degree of strength. Thus, if we have a thin image entirely free from fog to commence with, we have the power of intensifying it to almost any degree without instituting any abnormal developing action capable of producing fog or destroying the due gradations of the picture. In the first method the picture is treated with a solution of nitrate of lead and ferricyanide of potassium, which, by a complicated reaction, converts the image into a mixture of the ferricyanides of lead and silver, in which the whole of the original silver is present, the lead being added matter. The latter may be subsequently replaced by an equivalent of silver, and an image formed containing, according to the authors of the method, three times the original quantity of silver. The process is, however, complicated, requiring very great care in the manipulations, and is superseded by the simpler bromide of copper plan. This is similar in its reaction to the other—a double salt of silver and copper being first formed, the copper being then replaced by silver; but the change is effected in a much shorter time, and there is less risk of spoiling the result by insufficient or careless washing between the various operations. We have tried both plans, but are strongly in favour of the latter. When it is necessary to resort to development to reduce the silver to the metallic state it is indispensable that alkaline pyro. be employed. We call the attention of our readers to this new power, which will frequently be found of great use in special cases.

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CHROMOTYPE PRINTING.

After the numerous articles on chromotype printing which have appeared in the journals lately it seems impossible, at present, to bring forward anything like novelty in the process; but I cannot forbear giving a method which is, I think, extremely simple, and which has produced highly satisfactory results. I have also sent several "hints" which I have not observed in the communications of your correspondents. I shall divide the subject into four parts—sensitising, printing, developing, and transferring the tissue.

Sensitising the Tissue.

In the first place, I prefer autotype tissue; it gives, in my opinion, far richer-looking prints than Lambertype. Cut off your bands of tissue just sufficient paper for the negatives you want printed, and *no more;* for the sensitised paper, when kept, if it be only for a day, will plunge you into all kinds of difficulties from its insolubility and sensitiveness to the atmosphere.

Immerse your sheet of paper in a solution of ordinary bichromate of potassium, made according to the following formula:—

Bichromate of potassium	1 ounce.
Ammonia	10 minims.
Water	30 ounces.

Keep your paper in this solution exactly two minutes, and for sensitising always adhere to this length of time. Although your prints be too dark, or too light, never alter your sensitiser, for if you do you will find that what you have already learned in printing you will have to learn over again. After two minutes have elapsed carefully draw your paper over the edge of the dish or pan you are using, and place it on a *clean* sheet of glass; then lightly pass your squeegee over the back, and hang it up to dry.

Printing the Tissue.

First get your negatives all together, and then the safe edge is to be thought of. For this take a piece of yellow paper, and cut in it an opening the size of the print you want, leaving about an eighth of an inch for the margin; fix it, with india-rubber solution, on the collodion side of the plate, and that is your safe edge. Next place your sensitised tissue so as to cover the opening you have made, but not to go *over* the margin you have allowed; that is to say, if your yellow paper be not large enough to cover the side of the negative you want printed, and your sensitised paper goes over the yellow paper, you will have no safe edge. Press your paper down with the ordinary materials for that purpose, and your negative is ready for printing.

I have used both the actinometer and photometer for judging the number of tints; but I prefer the former for its simplicity and correctness. I take this description of it from the Autotype *Manual:—*

> "It consists of a small tin box, containing a roll of sensitive silver paper arranged in such a manner that it can be drawn under a clear opening in the glass lid of the box, the space surrounding this opening being painted a light tint, such as that assumed by silver paper with a short exposure. When the sensitive silver paper has assumed the same tint under the clear opening as that painted on the margin, the actinometer is said to register one tint. The paper is now drawn forward to the extent of the opening so as to hide the tint just made, and another breadth of the colourless paper exposed, which is, when in its turn tinted to the standard degree, the 'second tint,' and so on."

No rule can be given for exposure; experience alone will tell you that, but I have found from two to four tints sufficient for any negative I have printed.

Developing the Tissue.

Take a sheet of opal glass; let it be carefully cleaned, and free from scratches; pour on it a small quantity of a solution of—

Wax	10 grains.
Benzole	2 ounces.

Gently rub it vertically and horizontally, until the solution has evaporated; then lightly polish it with a piece of flannel, till all streaks and marks have disappeared. Now coat the polished surface with ordinary collodion, and immerse it in *clean* cold water for about three or four minutes; after that time take it out and wash it well with running water. Next empty your cold water out, get some fresh, and place the prints in it until they are quite limp; then put them on the plate in the following manner:—Take up a little water out of the pan, on the back of each print, and let it glide off on to the plate; then lower one end of the print first, so that only one end touches the plate, let the other part come gently down, and it will press out all air-bubbles. Now place them under pressure for two minutes, unless you have kept them in the water too long, or have been rash enough to try and put them on a second time. Under such circumstances ten minutes is the time of pressure. Next prepare your developing water. Make it 100 degrees Fahr. Put your prints into it; but never, if you value clean and brilliant results, let the backs float off—always pull them off as soon as you can. When developing, if one appear too dark, and it be not an intense negative, you may bring it down with boiling water. There is no remedy in the development for a light one. After development carefully wash with running water, fix in alum for about five minutes, wash again, and dry.

Transferring the Tissue.

Cut a piece of ordinary double transfer paper a trifle smaller than the plate you want to place it on, immerse it in water 100° Fahr., keep it in ten minutes, then take it out and put it into clean cold water; rinse your plate with cold water, place the paper on it, and *lightly* squeegee. I am not sure, but I have very good reasons for believing, that light squeegeeing prevents reticulation.

Of course all the foregoing merely applies to plain carbon printing. There are ornamental tinting, ovals, cushions, and various other forms; but if this plain method of working the chromotype process be accomplished, the other part is very easily done.

Charles King.

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VENTILATION OF PHOTOGRAPHIC STUDIOS.

[A communication to the Edinburgh Photographic Society.]

In bringing the subject of this paper before the members of the Society it is with the view of correcting an evil which, to a very great extent, exists in our midst. It is on the subject of the ventilation of studios that I wish to say a few words.

Photographers, it would appear, seem to have a great dread of fitting up a ventilating apparatus in connection with their studios, and more especially in their dark rooms. I have heard various reasons for such non-appliance of a ventilating apparatus. One of them is that white light would come in and spoil all their work, and thus become a great source of vexation and annoyance. Another reason is that any down draught which might occur (and they very often occur in the general forms of ventilating systems) would raise the dust from the floor and furniture connected with the studios, and, while thus floating suspended in the atmosphere of the place, their wet plates would come in for a great share of the mischief which would thus be caused; and to prevent all this they would rather prefer to suffer from an ill-ventilated studio than have all their best efforts spoiled by that inveterate photographer's enemy—dust.

How often do we see those much engaged in dark-room operations, when they come into the lighter apartment, wiping the perspiration from off their forehead, and altogether looking as if they were glad to enter a better and more wholesome atmosphere! There is no doubt that some of our studios are very badly ventilated (if ventilated at all), and this is why there is always such a strong smell of sulphuric ether, which is present in the collodion, in such studios, and which, though characteristic of the profession, is very offensive to delicate constitutions, and to ladies more particularly.

I once came in contact with a lady who had just returned from such a studio, and who went with the intention of getting photographed; but on entering the establishment the "etherial perfume" was so strong and overpowering that she nearly fainted, and had to get cold water applied to her in the manner generally employed when people are in a fainting condition. When she had recovered she got into a cab and drove home. When I saw her afterwards she vowed she would never again enter a photographic establishment, and she has held such places in the greatest dread ever since.

Now, if we had a complete system of ventilation in our studios such accidents would never occur, and the benefit in point of health would be great to all concerned, more particularly to those who are much engaged in dark-room operations. Such people run great risk of injury to health. It may not come upon them suddenly, but nevertheless its slow progress is not to be overlooked and allowed to pass unheeded. I have positively heard a photographer on whom I have called state that he felt his "head quite muddled," and this undoubtedly was due to the stifling condition of the atmosphere he was breathing.

I will not say that all studios are alike in this condition—far from it; for there are some in which I have been that, on the whole, were well ventilated. Some are ventilated by a current of air being made to pass freely through the studio in the form of a draught by having two opposite windows or other openings freely open, thus causing a draught; but this method of clearing a place is very objectionable from a health point of view. What we want is a complete and continuous system of ventilation, by which I mean to have the foul or impure air drawn off as soon as formed, and this without a down draught.

Now, there is only one system of ventilation at present in operation with which I am acquainted that can bring about this desired end; that system is the one patented by Messrs. R. Boyle and Son, of Glasgow, and which they call "Boyle's patent self-acting air-pump ventilator." They have no movement in them, and therefore cannot get out of order. They remain to be ventilators as long as the metal holds together, and they are just as efficient in their action as ventilators after they have been in use for twenty years as the first day on which they were put up. They are neat in appearance, and can be made to any pattern or design furnished by an architect, while you will see by the price lists that they stand very favourable comparison, as respects cost, with any form or system of ventilation now in existence.

There are various systems adapted to studios, but they are all more or less inefficient and unreliable. Those which have a movement in them are objectionable; for, should they get out of order (as they frequently do), the effect is anything but pleasant. I will only here refer to the Archimedian screw, which we see so often applied to studios and other buildings.

This apparatus is at any time liable to a down draught, and when such takes place there is a continuous downpour of cold air, sometimes accompanied by rain and soot, and all other impurities to be found contained in the atmosphere at the house tops. It likewise makes a disagreeable noise at times, to the great annoyance and irritation of all who are unfortunate enough to be within hearing. Its appearance, also, is not in its favour. From its construction it cannot be made more ornamental, unless by materially interfering with its efficient action. Mr. Boyle informs me that they have had to remove a great many of them on account of the great down draught which they admitted, replacing them with their own system, and the air-pump ventilator gave undoubted satisfaction.

The syphon ventilator is quite useless for ventilating purposes. Any system which allows cold air in from above must be condemned, because the cold air coming in cools the heated and vitiated air naturally found near the ceiling, which, thus losing its upward force, is again returned to the apartment to be once more inhaled; hence, though we are getting cool air we are not getting pure air, which is an important matter—a point often overlooked—and it is worthy of our best and immediate attention.

Ventilation obtained by means of running a pipe into a smoke flue is very objectionable, on account of the back draught and the disagreeable smell which it produces; while, beside this serious objection, soot coming into the apartment would spoil everything in the place, and picture frames would soon require regilding. Such was the case in the house of Mr. John Stirling, Governor of the North Prison, Glasgow, who had his house so ventilated. Mr. Boyle had to undo the whole system and fit up his own, and Mr. Stirling is quite delighted with the agreeable change thus brought about.

The air-pump ventilator consists of four sections, each acting independently of the other. The external air impinging on the lower plates (or diaphragms) is deflected at different angles over the central radial plates, and in passing out exhausts the internal chambers, creating a partial vacuum. The foul air immediately rushes up the shaft (that connecting the ventilator with the place being ventilated) to supply the place of the air extracted, thus securing a continuous powerful upward current and no down draught. Studios on the ground floor, surrounded by higher buildings, are generally subject to a down draught, owing to the wind striking the higher buildings and being then forced downward with a swirl, and the studio is the place where it is most felt, by its being on the lower ground. Now, for this position of affairs Messrs. R. Boyle and Son have a modification of their patent which is entirely impervious to down draughts, and such positions as the top of these studios are the very best places for its efficient action. It is not intended so much to create an up draught as to entirely prevent a down draught.

I have no personal interest in the concern whatever. I only take up the matter on scientific grounds; and I can only say that if the system now recommended be once applied great will be the satisfaction to all concerned. In conclusion: I can only say that Messrs. Boyle and Son deserve great credit and encouragement for the useful invention which they have produced: and I have no doubt that, before long, they will reap the profitable harvest to which they are so justly entitled. JOHN LAING, F.R.S.S.A.

* * *

THE PERMANENCE OF SILVER PRINTS.

THAT the outcry as to the want of permanence in silver prints is louder and more persistent now than it used to be some twelve or fourteen years ago seems generally admitted; but it may be worth while to consider to what this may be due, or whether it be justified by facts.

It may possibly be that the converts to the new faith (carbon) look back with a too-bigoted and prejudiced eye upon those they have left in the old fold, and are apt to speak more disparagingly of their old love than is really warranted; or it may be that, from causes not fully understood, the *fact* may be true that silver prints *do* fade more rapidly than was the case in former years.

Some few remarks upon this subject may not be uninteresting. I have recently had the opportunity of looking over a large number of prints, produced by various hands, which have been in my possession for many years, and I think that the history of some of these prints, which can be accurately traced, may help us to lay the blame of the reiterated complaints upon the right shoulders.

Among the number of prints alluded to I find a parcel printed in the year 1864 upon paper the preparation of which can be verified. This paper was albumenised with perfectly-fresh albumen, well beaten, and used the following day. The toning in this case was done in a bath of phosphate of soda and gold. The colours remain as brilliant as when they first came into my hands.

Another parcel I find noted as printed about May or June, 1866, toned in an acetate of soda and gold bath, and are free from any deterioration. These prints are *not* mounted.

Another batch were printed upon "Sutton's patent" paper—that is, floated before albumenising upon a solution of caoutchouc in benzole. These prints always showed a slight "mealy" appearance over the whole surface, but no indication of yellowness is exhibited. These prints must have been produced somewhere about 1863, but I cannot verify the exact date.

Another example printed on February 13, 1868, remains perfectly free from defect.

The next examples under notice are somewhat instructive. They are two prints from the same negative upon the same description and make of Rives paper—but one made with fresh albumen, the other being repulsive in its odour. They were printed about June,

1864. The first print retains its rich purple-black colour; the second is altogether much redder than the other and the high lights yellow. When printed these proofs could not be distinguished one from the other.

The next parcel I find were printed by Mr. W. H. Prestwich, then of Reading. As that gentleman left Reading, I think, some eight or nine years ago, if not more, they must have been printed fully that time. During four of these years this parcel has, with others, been stowed away in a damp cellar, where plate-boxes and other similar woodwork have become thoroughly decayed and spoiled. One print shows a tinge of yellow round the edge; the others are perfectly preserved. These prints are unmounted.

In all the above cases, with the exception of the comparative experiment noted, the paper was prepared with pure and fresh albumen, and to this cause I attribute the escape of the prints from destruction.

I cannot avoid thinking that if care were always taken by those who prepare albumenised paper for the profession to use none but perfectly *fresh* albumen, even if it should necessitate additional cost, much of the complaint that is heard of the fading of silver prints would cease. The remedy is in the hands of photographers, and price should not always be the first consideration, as in too many instances, I fear, is the case.

That the future of photography will be "carbon" is undoubted in my opinion, and that the prospect of permanence is greatly enhanced on that account is certain; still it is but fair to acknowledge the existence of prints unchanged for a period longer than that to which any carbon prints can yet lay claim.

Among the silver prints which have so well withstood the test of time is a collodio-chloride print. This was given to me by Mr. Prestwich, and I presume was printed about the same time as the proofs referred to above. I remember, when I received it, being struck with its beauty. It has now, I will not say *faded*, but the colour has altered from its original rich hue to a yellowish-brown.

John A. Spencer.

PHOTOGRAPHIC DIFFICULTIES.

[A communication to the South London Photographic Society.]

The subject I have selected is one, I fear, that will not be considered of that instructive nature it ought to be. I will endeavour to combine a little mirth with a few practical hints. Many of the incidents I shall allude to caused me much annoyance, vexation, and trouble. I can now smile at them, although they had a very contrary effect at the time. Taking views of London is very trying to one's nervous system. I used to be considered rather amiable; I am thought the opposite now, and all through this class of work.

The English climate is very variable, and the London atmosphere most peculiar, depending upon the wind. Living, as I do, at the extreme west, I have scores of times left home when beautifully bright and the wind from the west, but journeying eastward the atmosphere gradually gets misty, so that at three miles' distance the buildings at the ends of very short streets are usually hazy. I have lingered about for hours whistling as a sailor does for a breeze, and with a similar result I imagine. I return home without unpacking my things. When the wind is from the east I have often seen the sun almost red with haze, and concluded it was useless leaving home; but, to my annoyance, I have afterwards found that the day in the city has been an exceptionally fine one.

I never attempt a view unless the light is favourable, for the slightest haze is fatal to a London photograph. There are some views—particularly distant ones—on the Thames that require exceptionable days. I have gone to two places in particular as many as twenty times in the season without taking a satisfactory negative. It is a common thing to go to many places three or four times and do no good, owing to the condition of the atmosphere. These peculiarities are so common that I am obliged to regulate the work accordingly—going eastward when the wind is from the east, and keeping westward when the wind is from the west, these being the two prevailing winds. I have often risen at three o'clock in the morning to do early views, and have been anxiously watching the rising of the Sun, waiting until he was sufficiently high, but my old enemy has risen with him. In such a case nothing can be done; for the general fire-lighting has begun, and London is in a mist until ten o'clock. I have found it almost an invariable rule that work done between seven o'clock and ten is unsatisfactory.

When I first attempted street work I tried a tent, and many are the troubles and vexations I have encountered. The first form of tent I used was an imitation Smartt's tent with a flat top, on which was placed the water tank. It must have closely resembled a shower bath, for I have been often surrounded with a crowd and described when inside as "a cove taking a shower bath." The next form I used was Leake's box tent. This was a very convenient form; but, as it was so constantly knocked and blown over, I was obliged to discard it. I then tried Wilson's, the one great advantage of which was its extreme portability; but there were also many disadvantages connected with it—dust, wind, the curiosity of outsiders to lift it up to see what was going on inside, and the difficulty of finding places to erect it.

The tent nuisance at last became so unbearable that I resolved to start a "trap," and purchased a two-wheeler from Mr. Earle, of Worcester. This was a mistake, for it could not be used with the horse in the shafts, and it was very difficult to find retired spots where the horse could be taken out. This circumstance was the cause of many mishaps. I was once engaged photographing on Whit Monday, the horse standing near the shafts with his nose-bag on, when a pleasure van, with a band playing most vociferously, startled the horse. The nose-bag became entangled with the end of the shaft, and the plunging of the horse upset the cart just as I had stepped out of it. You can easily imagine the mess caused by the upsetting of eighty ounces of bath, while most of the bottles were smashed. Had I been inside I think my most intimate friend would have failed to recognise me half-an-hour afterwards—smothered with silver bath, collodion, &c. This, of course, terminated my day's work. It would not have made a bad subject for an illustration in *Punch*. Several other accidents happened. When in use legs were utilised to make it firm. On two or three occasions my assistant attempted to get inside before they were adjusted, when suddenly down went the cart and extinguished him.

The next vehicle I had built specially for me. The style is that of a hooded waggonette, which answers admirably. I have not had any mishaps with it. It is often an object of great attraction, and many guesses are made as to its use, being from time to time presumed to be an ambulance, a fever or small-pox carriage, or, when near a cemetery, the workhouse hearse. The horse, being black, has tended to corroborate the last idea.

I am now so well known to the police that I get great assistance from them in keeping back the crowd. When I find a difficulty in taking a photograph from the pavement I get into the gutter, and the traffic keeps back the crowd from the front of the camera. I am sometimes so bothered that after focussing I take the bearings, turn the camera at right angles, and talk to the crowd, asking them to be steady just while I count one, two, three, up to fifteen. My assistant puts the plate in, turns round the camera and exposes, whilst I am assuring the surrounding throng that if they will only be quite still they will have the pleasure of seeing their faces for sale, with ballet girls and bishops, in the shop windows. In resorting to this dodge it is necessary to use a larger plate than necessary to allow for any error in turning round the camera.

The following is a common and most annoying circumstance:—Imagine a view to be taken across the street in a very busy thoroughfare, with only occasional sunshine. You are aware that in a few minutes the sun will become obscured; you rush to expose, when an omnibus stops to take up or put down a passenger, and when the vehicle has started the sun has become overcast. After waiting for five minutes or more the sun has again become bright, but a loitering cabman catches sight of you and asks your charge for doing a good-looking fellow like himself! It is useless to remonstrate. The next obstruction is a mud cart, then a stream of heavy traffic carts loaded with straw, or there is a block. All this time the sun is shining beautifully, but when all these obstructions are cleared off it has become cloudy again, and no chance remains of taking the photograph. This is not an exaggeration; it is one of common occurrence. I always give long exposures for such subjects to prevent "ghosts."

I often wish to introduce figures, but this requires the greatest caution; for, if the crowd catch the idea, off they all go to be taken. In that case it is useless to interfere, for a crowd collects which takes a long time to disperse. To get rid of a crowd I am often obliged to take away the camera, and afterwards return when the place is clear. Sometimes I am annoyed by troublesome people, who will persist in being taken. I then put on an appearance of indifference, as though it was all over, and so tire them out. It is useless to attempt to take them, for they invariably move on during the exposure if not asked to be still. When an opportunity occurs of working from a first-floor window it is a great treat. I generally acknowledge this favour by sending some photographs. I was once tendering my thanks in this way when I was curtly informed that that was an old story—a promise never fulfilled. The price then named was five shillings, which I paid, with thanks for the accommodation.

I will now describe my apparatus. The camera-stand I use is a very old form lately resuscitated, I think, by myself. Mr. Ayres lent me his, which I liked so much that I got Messrs. W. H. Oakley and Co. to make me two, and advised them to make them for sale. They did so, and had a block cut which they registered, and many thought they had registered this old form of stand, but it was only the woodcut. I find this stand most useful, having a range from three feet to six, allowing of its being used very low when doing a flat tomb, while it allows of adjustment in the most awkward positions—on the roof of a house, or on the seats or stalls of a church when doing interiors. I now often wonder how I did without it so long.

I never use a swing-back, and that for various reasons. It prevents the camera (the form I use) from closing sufficient for the shortest focus lenses, and it adds to the bulk and expense. I find the sliding front answers every purpose. I have an additional piece hinged on the front which allows of its going up any height. This arrangement would not do for the old form of lenses of large diameter and small field. The small diameter of the symmetrical lenses is a move in the right direction, combining portability and lightness, being evidently the result of the studies of a practical man, making one flange answer for a stereoscopic lens or for one covering a twenty-inch plate. With the sliding front I can succeed in taking a building at an angle of forty-five degrees. This brings the subject almost close to the circle of definition; blocking out the sky, of course, is necessary. By reversing the camera front I am enabled to photograph from an elevation and still keep the camera perfectly level. This is very important for flat tombs. In confined situations I invariably keep the camera quite level.

To keep the camera-stand steady when windy I have improved on the old idea of a loop for placing the foot in and bearing heavily on it, by introducing an india-rubber door spring, which allows of the foot remaining firm on the ground instead of moving and, perhaps, doing what you are anxious to avoid.

I will now pass from the streets into some of the most difficult interiors. The Houses of Parliament, Tower, and Temple are the worst, requiring exposures of nearly two hours. Two negatives a day with four cameras at work is a fair average. All sorts of exposures are necessary in Westminster Abbey—from half-an-hour to two hours. In St. Paul's it is the same.

My experience with interiors varies considerably. One year I found that plates kept in the bath nearly half-an-hour answered the best; another year I found it the very opposite, from which I conclude it is almost impossible to work to any rule, as it depends in a great measure upon the particular kind of collodion in use at the time. I find it important to use a new bath of forty grains to the ounce, with as little acid as possible, an old collodion with the addition of one or two grains of bromide to the ounce, and strong developer; also to use albumenised plates, plenty of blotting-paper, and to keep the backs well sponged out and varnished where the plates touch, fixing thick brown paper saturated with water on the back of the plate and at the bottom of the camera.

My old enemies—the public—follow me even into sacred places. With exposures of an hour you cannot sit down beside the camera, so I work two. Well, on returning to develope, imagine my horror in finding an anxious mother gratifying her offspring's curiosity by lifting up the child to peep into the lens, the youngster steadying himself by holding on to the lens; or an indulgent papa gratifying his little girl by lifting her up to play an imaginary tune with the focussing-handle of the camera! F. York.

NOTES ON PASSING EVENTS.*

By a Peripatetic Photographer.

A photographer, if he be really clever, can make a photograph tell almost any tale he desires. He can even make a lady of the period appear to be a gentleman if he choose to photograph her from the proper point of view, showing her little "billy-cock" felt hat guileless of a single bit of feather or ribbon, her close-buttoned pilot-cloth overcoat-looking jacket, and, lastly, her dreadfully circumscribed skirts, which—if the light and shade be very slightly manipulated—show a something about the width of the legs of a pair of "inexpressibles." Every one now knows that a duck-pond may, in a photograph, be expanded into a lake, a lump of coal into a huge rock, and, *per contra*, a mountain reduced to the dimensions of a molehill. One morning during the past month a camera might be seen in a certain street in London carefully placed so as to take a view of one side of a balcony or triangularly-projecting shop front, as if to give prominence in the photograph to the words which appeared on that portion of the building facing the camera. In a chancery suit which followed in a few days, in the Chancery Division of the High Court of Justice, the result was that a Vice-Chancellor decided that the words which faced the camera were illegal and must be suppressed; but an appeal to the court over which the Lord Chancellor presides, who may possibly have had his attention directed to what appeared on the other and unphotographed face of the angular sideboard, resulted in a reversal of the previous decision. It is only in accordance with human nature and artistic policy that if a photograph is to be taken so as to tell a special tale it should be made to do so in the most unmistakable manner possible. Still, a photographer must never lose sight of the fact that as there are proverbially two sides to every question, so there are two ways in which every scene may be represented, and, very curiously, both may be literally and scientifically right. Is not photography a versatile art?

One day last week I went into a neighbouring restaurant and ordered, *inter alia*, an egg *and* a cup of coffee. The latter was duly brought; "but where is the egg?" I inquired. "It is *in* the coffee, as you ordered." This result of a mistake in apprehending my instruction set me a thinking. "Here is my coffee," pondered I, "in as hot a condition for drinking as I can desire; it contains an egg in a state of perfect liquidity, but how is it that the egg is not acted upon by the heat and become coagulated?" It then flashed through my mind that the Editors of this Journal in a recent article had alluded, as something out of the usual course of chemical or physical nature, to the non-coagulability of albumen when it had been absorbed by gelatine previous to the liquefaction of the latter by means of heat. Having ascertained, from mine host, the *modus operandi* by which an egg is mixed with hot coffee so as to retain its fluidity, I resolved to lose no time in applying this principle of gastronomic action to photography. Accordingly, I beat up to a froth the whites of two eggs, and, after the froth had become liquefied, I poured the fluid albumen slowly and with constant stirring into a gelatine emulsion prepared for the purpose, which at the time was of a temperature quite equal to that of hot coffee. In this way I obtained a mixture with which I coated several plates, and which, when used either moist or dry, yielded good negatives. The albumen has not shown any indications of coagulation, but it is not difficult to account for this, seeing that the degree of heat to which the gelatine is raised in order to its being liquefied is less than that required to coagulate the albumen. But I should not wish it to be understood that I make any claim on the score of advantage for the addition of albumen to a gelatine emulsion. Before I am in a position to do so, I shall have to try many more comparative experiments than I have yet had leisure to make.

The discussion on the nitrate of silver bath "drags its slow length along" at the "Parent" Society, and it is really wonderful how such a subject may be "dawdled-out." At the rate of progress hitherto adopted the discussion may very easily be prolonged for five or six more meetings. As yet only one phase of the bath question has been discussed; but there are several others yet untouched, among these being the method of utilising a bath when it has ceased to produce satisfactory negatives. Also, the effect of the fusing of nitrate of silver, which would form an interesting topic in such a discussion; and, in passing, the whole subject of nitrite of silver and its alleged quality of conferring rapidity would come in for a share of the light one might reasonably expect to be thrown upon the question. One of the most rapidly-acting baths of which I have ever been aware was prepared with the ordinary fused silver (lunar caustic) of the shops; and, if I recollect aright, the conclusion at which I arrived at the time was that its great rapidity was probably owing to the presence of a trace of nitrite formed in the course of fusion. Be this as it may, there are many other aspects from which to view the nitrate bath than the "pinhole" phase of action about which so much has already been said.

THE COLLODIO-ALBUMEN PROCESS.

[A communication to the Bristol and West of England Amateur Photographic Association.]

The collodio-albumen or Taupenôt process, though one of the oldest of the dry methods, still maintains its place as regards certainty and keeping qualities. Its other advantages are—that any slight error in exposure may be rectified in the development, and that the finished negative requires no coating of varnish, which of itself is no small recommendation. Its disadvantages are—the double coating, and the tendency to blistering of the film. The latter failing may be much, if not entirely, obviated by using new plates, or such as have not been repeatedly coated, and also by the employment of collodion yielding a powdery film. I find Rouch's "extra" answers well. The plates must, of course, be carefully cleaned, so as to possess a highly-polished surface. I have never found it necessary to employ a preparatory coating of albumen, india-rubber, &c.

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* Concluded from page 210.

The plate is coated in the usual manner and immersed in a thirty-five-grain nitrate bath, the crystals being simply dissolved in distilled water. It is afterwards washed till the water ceases to show any turbidity, then drained on blotting-paper for three minutes, and the iodised albumen applied twice by flooding the surface of the plate placed over a shallow porcelain tray. It is then placed in a box on blotting-paper to ensure absence of dust, and allowed to dry. When dry it must be heated over a spirit lamp till, by drawing the finger nail round the edge, the albumen appears hard and horny, then allowed to cool, and immersed in the aceto-nitrate bath, consisting of forty grains of nitrate of silver and forty minims of glacial acetic acid to the ounce of water. It may remain here from two to five minutes. On removal wash as before, and when dry it is ready for exposure.

A great secret of success in this process is to give sufficient exposure. The plates I generally work with are 10 × 8, with a lens of fourteen inches focus. Under these conditions, and with a half-inch stop, in sunshine I give eleven minutes.

I develope in a shallow glass tray, placing the plate face downwards, and supporting one side of it by a small slip of glass, so as to prevent it touching the bottom. By this means the developer remains clean to the end, and the surface of the negative is not stained. I fix with hypo. solution, to which I add a drop or two of acetic acid—just enough to destroy alkalinity, and render it feebly acid, as with an alkaline solution blisters are very apt to arise. When dry the albumen surface will be sufficiently hard to enable you to dispense with varnish.

The following is the formula I have used for the iodised albumen:—

Albumen	3 ounces.
Distilled water	1 ounce.
Strong liquor ammonia	10 minims.
Iodide of ammonium	10 grains.
Bromide of potassium	10 „

The developer consists of (for a 10 × 8 plate)—

Cold saturated solution of gallic acid	6¼ ounces.
Glacial acetic acid	35 minims.
Pyrogallic acid	2½ grains.
Solution of nitrate of silver (20 grains to the ounce)	50 to 60 minims.

Do not add more of the silver solution than is absolutely necessary.

G. S. Thomson, M.D., F.M.S.

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UPON WEAKENING, INTENSIFYING, AND TONING CARBON PICTURES.*

I.—Intensification with Manganese.

1. As I have already mentioned, at present permanganate of potassium is the almost exclusively-employed intensifier for carbon pictures. It colours the picture olive-green, and is excellently suited for negatives of reproductions of engravings.

2. If the carbon picture treated with permanganate of potassium be coated with pyrogallic acid it rapidly becomes of a warm sepia-brown, and increases considerably in density.

3. Gallic and tannic acid colour the manganic picture almost a pure black, the depth of the colour depending upon the quantity of these reagents contained in the solution.

The methods 2 and 3 are remarkably well-suited for transparencies. Sulphide of potassium and sulphide of ammonium discolour the above-mentioned intensifiers, and may, therefore, at a pinch, be employed as clearing mediums.

4. The behaviour of the picture film is remarkable when indigo is combined with the brown oxide of manganese. If a manganic picture be placed in a solution of the extract of indigo the colour of the picture varies through all the shades from blue to rose-violet according to the strength of the solution, its temperature, and the time the picture was left in the intensifying bath. Long lying in the dissolved indigo darkens the whole of the picture and deprives it of the light parts. Though this method is an energetic intensifier, I cannot recommend it either for negatives or transparencies, as it requires a thorough study before one is in a position to get the result he wishes, and to get it always the same; besides, the picture film is sometimes also insoluble.

II.—Intensification with Iron.

Laurent has given a blue-black tone to the carbon print by treating it with an old iron developer and a solution of gallic acid. This method has been improved upon by Monckhoven:—The carbon picture is placed successively in three solutions and well washed after each. First solution: forty grammes of ferric sulphate in one litre of water. Second solution: twenty grammes of pure carbonate of soda in one litre of water. Third solution: ten grammes of gallic acid in one litre of water. The picture remains five minutes in the first solution, ten in the second, and in the last until the desired dark violet colour has been reached.

According to my experience a solution of any iron salt is suitable for the intensification, in the narrowest sense, of carbon pictures; but the presence of the ferric or ferrous salt has but an indistinct influence upon the tone of the colour. If one wishes, therefore, to make use of an iron intensifier he may use any iron salt without distinction which he may have at hand, whether it be an iron developer, ferric sulphate, ferrous sulphate, iron saccharat (sugar of iron, probably ferric acetate), &c. Iron chloride, as a rule, behaves with the intensifying reagents like the salts of iron peroxide. Intensification with iron proceeds very rapidly when a concentrated solution is used. If this intensifier should be used for toning transparencies a few experiments will be sufficient to produce any tone which may be desired by individual taste.

5. Pyrogallic acid colours the iron picture a deep yellow-brown (warm sepia).

6. Gallic and tannic acids produce a series of tones, varying with the iron salt used, from violet to a deep black.

7. Sulphide of potassium and sulphide of ammonium furnish a deep black colouring with a greenish reflection. This intensification covers well.

8. The alkaline carbonates colour a reddish-brown. This intensification must be used with care and should not be allowed to act too long, because the alkalies give the picture film a reticulated appearance, and have a decomposing effect upon the gelatine.

9. The iron picture is similarly coloured by permanganate of potassium; and if the picture has not been sufficiently well washed it receives a metallic, shining coating, which, however, does not interfere with the colours of the picture when viewed by transmitted light.

10. The picture intensified by No. 9 takes on a dark black-brown tone when treated with gallic, tannic, or pyrogallic acid.

11. The iron picture takes on a deep blue colour from the reaction of ferricyanide of potassium, and a deep green from a mixture of ferrocyanide of potassium and bichromate salts.

In order to lessen the iron intensification or to remove any fog which may have been accidentally intensified along with the picture, and to give the picture greater contrasts in the tones, a weak solution of oxalic acid may be used as a clearing medium, and also a solution of citric acid.

III.—Intensification with Lead.

12. If a carbon picture be placed in a four-per-cent. solution of plumbic nitrate, and then if liver of sulphur or sulphide of ammonium be poured over that, it will quickly become of a dark reddish-brown.

13. Bichromate of potassium and bichromate of ammonium develope chrome yellow in the lead picture, and colour the black pigment of the carbon picture green.

14. The alkaline carbonates colour the lead picture white. To increase the density it may be browned in a solution of sulphide of potassium or sulphide of ammonium.

15. If the lead picture be dipped first into ferrocyanide of potassium and then into chloride of iron it will become whitish in the first and dark green in the second.

16. If the lead film be saturated in a mixture of nitrate of lead and solution of ferrocyanide of potassium, and then placed in a solution of an iron salt, the picture immediately becomes a deep blue.

17. The carbon picture takes on the same colour as with No. 12 if, instead of being placed at first in the pure nitrate of lead bath, it be placed in the above bath of nitrate of lead and ferrocyanide of potassium, and then be blackened with sulphide of ammonium or of potassium. Here hyposulphite of ammonium may be used for clearing or lighting over-intensified pictures.*

IV.—Intensification with Silver.

18. The carbon picture which has been saturated with gallic acid and then dipped into a two-per-cent. silver bath takes on a pleasant brownish-black tone.

19. Pyrogallic acid and nitrate of silver furnish warm purple-black pictures.

20. Bichromate of potassium or bichromate of ammonium and nitrate of silver cover the carbon picture brick-red.

21. Ferrocyanide of potassium and nitrate of silver make the picture a warm black.

22. Sulphide of potassium or sulphide of ammonium and nitrate of silver colour it an intense black with a purplish tint.

23. A mixture of permanganate of potassium and nitrate of silver acts like No. 19.

24. Chloride of iron, then nitrate of silver, and then gallic acid colour it black.

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* Continued from page 211.

* This method of intensifying was recommended by Herren Eder and Tóth for silver negatives.

25. Chloride of iron, then nitrate of silver, and lastly pyrogallic acid act like No. 19.

26. Pyrogallic acid, then nitrate of silver, and finally liver of sulphur or sulphide of ammonium act like No. 22.

27. Chloride of nickel, then nitrate of silver, then pyrogallic acid act like No. 19.

From the great number of possible silver intensifications which recommend themselves—not only on account of their intensity but also by the beautiful colour of their tones—I have only chosen a few, but they are sufficient to satisfy the carbon photographer. The silver intensification is by no means shy of the light. It can be undertaken without injury in daylight.

The greatest recommendation of the silver intensification is that it never fogs the picture, and even *frees faulty carbon pictures from fog.* This property is capable of explanation, since the picture film absorbs the solution in proportion to its thickness, so that by washing it is removed from the lightest parts to which the fog belongs; thus the nitrate of silver only reacts and deposits its coloured precipitate upon the parts in high relief. This is a general rule in intensification, though it is most evidently shown in this instance.

The finest fog-removing results are offered by intensification No. 19.

As a clearing medium for silver intensifications hyposulphite of soda may be taken. Cyanide of potassium in strong solutions sometimes injures the picture film, and is therefore not recommended.

V.—INTENSIFICATION WITH COBALT, URANIUM, AND NICKEL.

28. Cobaltic chloride and sulphide of potassium or sulphide of ammonium give an intense black with a brownish tint.

29. Chloride of cobalt and bichromate of potassium or ammonium give yellow-brown.

30. Ferrocyanide of potassium and nitrate of uranium give a warm sepia-brown.

31. Chloride of nickel and sulphide of potassium or sulphide of ammonium furnish a warm black.

32. Chloride of nickel and ferricyanide of potassium colour brown.

KARL VON STEFANOWSKI.

(To be continued.)

FOREIGN NOTES AND NEWS.

PROFESSOR J. HUSNIK'S NEW PHOTOLITHOGRAPHIC TRANSFER-PAPER.—ZINC WASHING-TROUGHS.

IN the *Mittheilungen* the following directions are given for using Professor Husnik's new photolithographic transfer-paper:—Prepare a solution of one part of bichromate of ammonium in fourteen parts of distilled water, and add ammonia hydrate until the solution becomes a light yellow and begins to smell ammoniacal. An excess is not injurious. Finally, add as much common spirit as would equal in volume four parts of the distilled water. Then close the mouth of the bottle with a tight-fitting stopper and store in the dark. To sensitise the paper the solution is carefully poured into a large shallow vessel, all sediment being kept back, and just as many sheets as are likely to be required for that day are dipped quite into the solution, prepared side uppermost, and immediately taken out again and dripped and dried in the dark. Under no circumstances should the prepared side of the wet paper be touched, as it will disturb the film and spoil the picture. Exposure in direct sunlight is recommended, and that should only last from one to two minutes. Should exposure in diffused light be preferred the printing-frame should be placed further from the window, so as only to be reached by perpendicular and not by slanting rays. This, of course, lengthens the exposure, which already requires about half-an-hour. If the negative be bad, and the finest lines are not as transparent as the thicker ones, nor the small whites between the shadows so opaque as the broad whites of the picture, it may be made useful by pasting a sheet of transparent paper at the back of the negative and heightening the too transparent parts with a lead pencil. To blacken the paper take some common lithographic fatty printing-ink and melt five parts of it with one part of wax; then thin down the whole to the consistency of oil with oil of turpentine. Now take a large sheet of paper or cardboard, lay the exposed picture upon it, then pour a few drops of the blackening upon the picture side, and spread it with a cotton rag over the whole surface of the sheet. When it is properly spread take another rag, which need not be quite clean, and wipe it all over slowly, carefully, and equally. In this way the paper retains only an equal grey tint which brings out very sharply all the finest details and opens out all the densest shadows, yet holds sufficient of the fatty ink to make a good impression possible. After an interval of five minutes the blackened paper picture is laid in water, and may then be developed in about ten minutes by using a sponge with very small holes. When the picture is developed lay it between sheets of blotting-paper and smooth it out with the hands, so as to remove all superfluous water; then let it lie free for about ten minutes, until it has attained the proper degree of dryness to be transferred to stone or metal. This is done by a slight pressure at first—only sufficient to make the paper picture adhere to the stone or metal; then the tension is increased, and the third time it is made even yet stronger. The rubber is then turned round and the stone drawn through under a heavy pressure. Every time it is pulled through fresh, tough, dry paper must be laid upon the picture to absorb the moisture. Now damp the paper picture and repeat the pressure two or three times in the opposite direction. Finally, the paper picture is strongly damped, and in about five minutes it is easily raised from the stone. All the colour remains upon the stone or the zinc, the further treatment of which is as usual.

Should the paper be intended for zincography it is recommended, if the weather or the temperature of the workroom be warm, that it be used six hours after being sensitised, as it adheres somewhat firmly to the metal and can only be removed in pieces. This is not the case in cold weather. Also, if the fatty picture be developed with a sponge the paper may be placed for a few seconds in a solution of one part of alum in twenty parts of water, and then dried and pressed. When so treated it does not adhere to the zinc and may easily be removed.

At a recent meeting of the Photographic Society of Frankfort-on-Maine an inquiry was made as to the action of zinc vessels upon the prints washed in them, to which Herr Geldmacher replies in an article in the *Monatsblätter*, where he reminds us that such vessels should be varnished or the contact of the metal with the prints prevented by a lining of wood, &c., as long as the prints retain the slightest trace of soda. Of course, when they are perfectly free from soda they may be washed in zinc vessels for any length of time without spotting; but, when that is not the case, wherever the prints have come in contact with the zinc greyish-white spots, having a greasy appearance, may be observed. Those pictures which have floated free in the water will remain uninjured.

Meetings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE usual ordinary meeting of this Society was held on Tuesday evening last, the 8th instant,—Mr. J. Glaisher, F.R.S., President, in the chair.

Mr. George Cutchie having been elected a member, the discussion on the silver bath was resumed.

The following communication was read from Col. Stuart Wortley:—

"During a visit to the Autotype Company's Works, last summer, Mr. H. J. Burton called my attention to a deposit which he found in their silver baths, and of which he was good enough to give me a specimen for examination. Having applied various tests with a view to discovering the nature of the salt, I informed Messrs. Burton and Wilkinson, at the November meeting of the Photographic Society of Great Britain, that this deposit consisted of sulphate of silver. As I was desirous of finding how and why sulphate of silver appeared so freely in a negative bath, I made the following experiment to see whether it was produced by the collodion:—I took plain collodion, and poured it gradually, stirring it all the time, into boiling water, and after allowing the precipitated pyroxyline to soak for a short time, drained off the water, and, having added to it a small quantity of strong solution of nitrate of silver, found, as I had expected, that sulphate of silver was thrown down. When the precipitated pyroxyline had been thoroughly dried and had been made into collodion, no further deposit of sulphate of silver was obtained in a silver bath in which collodion made with this precipitated pyroxyline was alone used. I think this experiment tends to show that sulphate of silver when found in a silver bath is dissolved out of the collodion. In the course of experiments on this subject I also found that nitrite of silver is a frequent cause of pinholes in the silver bath, and I have further remarked that it is far more copiously produced when plates prepared with a substratum are used in the bath than when the plates used are simply cleaned. This we should naturally expect to be the case, as the nitrite of silver would tend to be freely produced where organic matter is brought into contact with nitrate of silver. In the course of these experiments I have submitted the various commercial collodions, as well as those made by myself, to tests with regard to the production of nitrite and sulphate of silver in the bath, and I find that they vary extremely in their behaviour, one sample of collodion producing sulphate of silver alone in the bath, while the others produce sulphate and nitrite in various proportions, one of the best working collodions producing the nitrite in large quantities and very little sulphate. If a nitrite is added to a collodion it increases the sensitiveness, and it may be that some makers add a nitrite to their collodion. I noticed at a former meeting what Mr. Blanchard said with regard to the colour given to negatives by the use of nitrate of uranium in the silver bath. It is undoubtedly the case that nitrate of uranium does modify the colour of the negative; but the result is more easily gained by the addition of a few grains of sulphate of uranium to the ordinary iron developer. It is certain that the quality of the negative is improved by the use of salts of uranium, and I believe that the excellent printing qualities of uranium dry plates are largely due to the use in the emulsion of nitrate of uranium."

Mr. E. Dunmore exhibited a negative containing a great number of pinholes. It was taken several years ago. He attributed them to nitrite of silver, but of this he could not speak with certainty. The remedy consisted in strengthening the bath by the addition of more silver; this resulted in the entire disappearance of the pinholes.

Mr. S. Fry had for several years used Black's acid bath, as he found the presence of a large proportion of nitric acid in the bath conduced to cleanness and sensitiveness. At the present time he worked with a bath that was as nearly neutral as possible, this being according to the system of M. Boissonnas, whose method he now adopted in its entirety, securing thereby such a gain in respect of exposure as to obtain in ten seconds a negative which by the ordinary process would require an exposure of thirty seconds. The method he had always adopted for rectifying a disordered bath was to dilute with water, filter out the iodide of silver precipitated by this action, add ammonia and solution of caustic potash, boil for a brief period, strengthen, and place in the sun. When this method failed in restoring a bath to working order it was precipitated and the silver reduced.

Mr. J. Spiller inquired why Mr. Fry gave a preference to a mixture of the alkalies.

Mr. Fry said he was not chemist enough to be able to give a good reason for it, but he found the mixture to answer well, and he consequently adhered to its use.

Mr. T. Sebastian Davis referred to Mr. Brooks's practice of working a bath in an alkaline condition, as described by that gentleman at a former meeting.

Mr. F. Good had never employed an acid bath until the present month, but since he began its use he had not had a decently-clean negative. His pictures were previously clean and all that could be desired, and he should not again attempt to use an acid bath.

Mr. F. Eliot saturated his bath with carbonate of silver. There was then no occasion for the use of iodide of silver; it was better to saturate it with the carbonate. He attached great importance to keeping the collodion free from salts of ammonium. In reply to a question by Captain Abney, who did not think that carbonate of silver was soluble in a solution of nitrate of silver, he (Mr. Eliot) said that he made his own collodion, and salted it with a double salt of potassium and cadmium.

A Member asserted, from personal experience, that pinholes were not due to the use of methylated solvents for the collodion.

Mr. Spiller exhibited several prints from Mr. Bashford, Portobello, the negatives of which were taken in a bath that was kept in working order by means of carbonate of silver. Mr. Spiller then read a paper in which he summed up and epitomised the experiences of the various gentlemen who had contributed to the discussion.

The Chairman conveyed the thanks of the Society to Mr. Spiller and those members who had taken part in the discussion.

Captain Abney was then called upon to read a paper on *The Theory of Alkaline Development.* Owing to the lateness of the hour Captain Abney merely gave an outline of his paper, which, he said, would appear in the forthcoming number of the Journal. We hope to publish it next week.

The proceedings then terminated. The next meeting will be held on the 12th proximo.

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SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The usual monthly meeting of this Society was held on Thursday, the 3rd inst., at the House of the Society of Arts, Adelphi,—the Rev. F. F. Statham, M.A., F.G.S., President, in the chair.

The minutes of the last meeting having been read and confirmed, Mr. F. York read a paper on *Photographic Difficulties* [see page], during the reading of which he exhibited and described a rising front for the camera, showing contrivances for placing the lens at different heights.

The President said that Mr. York had done good service in relating his difficulties, showing that he would not be overcome by them. Photographers generally should be indebted to Mr. York for the great energy displayed, and the pains he had taken under disadvantageous circumstances. With regard to his operations in sacred buildings the results were of much higher importance than the simple commercial element; for they became of historic value, as, for instance, in the spread of our race in distant colonies. By these works they would there have an opportunity of becoming acquainted with those grand buildings which were the pride and ornament of our own times.

Mr. F. Howard remarked that he also had had some experience in street photography, and had used a duplicate dark slide, which having been put into the camera was then taken out and another substituted, holding the prepared plate, which then could be exposed without interruption. In steadying the camera upon smooth floors some corks put upon the iron spikes of the stand would be found very useful. He narrated that on one occasion, being out in the country, his friend's camera was blown over, and openings made in the woodwork; they went into a village, and getting some putty they carefully filled up the cracks and so got over that difficulty.

Mr. York observed that in using a rising front great advantage resulted from the introduction of small symmetrical lenses, as they could, from being so small, be brought right up to the top of the camera. He stated that having, on one occasion, gone out without a dark slide he simply wetted the inner face of the focussing glass, and, laying the sensitised plate upon it, it remained fast whilst being exposed.

Mr. J. A. Spencer also related that when taking a country view, it being just upon twelve o'clock, about five hundred children rushed out of school. He told them to sit in a row along the roadway on the opposite side and they would all be taken in. As soon as this was done he took his view, and the children were *taken in* also.

Mr. P. Mawdsley described how, on finding himself on one occasion without the screw of his tripod stand, he pared a piece of hard wood, and forcing it into the worm thereby made a thread, which remained so perfect that he used it for a week afterwards.

A vote of thanks was then passed to Mr. York.

Mr. W. Brooks exhibited some specimens of emulsion transparencies, showing that he could produce great variety in the tone of colour.

Mr. York stated that there were two subjects he was investigating on which others might like to experiment. One was the addition of acetic acid to the collodion, which remained the same colour as before. A neutral bath which before gave fog when tried with this acetic collodion gave very satisfactory results. He had used one drop of acetic acid to one drachm of collodion. The other experiment was that mentioned by Mr. A. L. Henderson, namely, the use of alum instead of spirit in the developer. He (Mr. York) thought that possibly any sulphate, either of magnesia, soda, or potassium, might answer the same purpose.

The President remarked that at the present moment, there being a dearth of new discoveries, it was as well to return to subjects which, although old, might, from the results of experience, be made interesting; and, alluding to Mr. Brooks's experiments with the magnet, said that, although the matter was at that moment simply an experiment, it might turn out of great importance.

Mr. Brooks observed that in carrying on further experiments with the magnet he had been able to reduce the exposure from fifteen to two minutes. He also remarked that, in the observations he had already made upon the subject with a certain purpose in view, he did not state all the conditions under which he worked, and promised to be ready at the October meeting with another paper upon the same subject.

Mr. F. Pearsall said that the facts which might arise out of Mr. Brooks's experiments none could predicate. Modern researches tended to show that light produced electricity. The proposition was that force, or power, was not destroyed. It had been shown that, taking the swing of a needle put in motion by electricity to be represented by nineteen, the force of the back swing was more, viz., twenty-one. What, then, became of the force of light? In the human eye such was the power exercised by light that it became necessary for darkness and sleep to intervene, so that it might recover its normal condition. Much, then, had to be investigated in connection with light as to its proper function in exciting electricity, so that the experiments of Mr. Brooks might help those who worked in that field of inquiry.

Mr. B. J. Edwards promised a paper on the *Nitrate Silver Bath* for the next meeting in June, and the proceedings then terminated.

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EDINBURGH PHOTOGRAPHIC SOCIETY.

An ordinary meeting of this Society was held in the Hall, 5, St. Andrew-square, on Wednesday evening, the 2nd inst.,—Mr. George A. Panton, Vice-President, in the chair.

The minutes of the previous ordinary and outdoor meetings were read, and the following gentlemen admitted ordinary members:—Messrs. J. M. Skinner, J. Somerville, R. Milliken, J. Reid, J. Boyack, A. Bogie, J. McLaren, J. Ballantyne, and D. Reed.

The business of the evening was commenced by the reading of a paper on the *Ventilation of Photographic Studios* [see page], by Mr. John Laing, in the course of which he exhibited several working models of the apparatus recommended, the action of which was considered very satisfactory.

On the conclusion of the reading of the paper Mr. Blanc, of H. M. Board of Works, exhibited in action a model of a ventilator the invention of Mr. Emerson, of America, which, he said, depended for its action on the same principle as that shown by Mr. Laing, but which was evidently much simpler in construction, and, according to his account, produced an up draught with much less wind. He stated that those ventilators had been fitted up in a number of government offices, and were giving the utmost satisfaction, even such large and fully-occupied rooms as those of telegraph operators and letter-sorters being kept comfortably cool and pure.

Mr. T. Pringle thought that the members were much indebted to Mr. Laing for the clear exposition of Boyle's ventilator, and especially for the satisfactory experiments he had shown. Throughout the paper the ventilation of the studio had been spoken of, while, in reality, it was rather the ventilation of the dark room that had been mainly referred to—the latter being, in fact, more necessary than the former, and in most cases more difficult to manage. While he fully appreciated the advantages of Boyle's patent, he thought the system they had in use, and which he supposed was the invention of their predecessor, Mr. Moffat, was at once the simplest and most efficient he had seen. Immediately over one of the windows and within a few inches of the roof there was an opening made in the wall about eighteen inches wide and six inches in depth. This was covered by a board hinged at the bottom, so arranged that it could be kept permanently open to any desired extent. One or two of the panes of the window were made to open, and the result was that the pure air rushed in through them, while the heated and impure air escaped by the opening above.

Dr. John Nicol had no doubt that under certain conditions the ventilators both of Boyle and Emerson would be very useful. In theory they seemed to be faultless, and, judging from the action of the models, they would be found equally good in practice. In principle they were identical, but he rather inclined to give the preference to Emerson's, both because of its simplicity and of its requiring a lighter current of air to bring it into action. They had, however, he thought, one defect in common—that is, that they *required* a current of air to bring them into and to keep them in, action. So long as a pretty stiff breeze was, blowing it was not, as a rule, difficult to ventilate ordinary studios or dark rooms; but, during days of sweltering sunshine, when there was not sufficient wind to stir the leaves of the silvery beech, such ventilators would be of no use whatever, and those were just the very days when ventilation was most needed.

Mr. Laing replied that while Emerson's ventilator was certainly more simple than those of Boyle, they, in his opinion, were objectionable, as, under certain circumstances, there would certainly be a blow-down or back draught. As regarded the system mentioned by Mr. Pringle, it would do tolerably well in ordinarily good weather, but during a strong wind it would not do at all. He did not think there was much force in the objection urged by Dr. Nicol, as, however quiet the day might seem on the level, there would always be a sufficient draught on the housetop to start and maintain the up draught.

Mr. Turnbull exhibited what he claimed to be "an improved form of actinometer." It is of tin, about the size of an ordinary snuff-box. On the lid, which is of glass, is pasted a series of thicknesses of *papier mineral*, arranged in the ordinary way. The sensitive paper is wound round a roller, and may be pulled out as required. So far as could be made out from the description, the principal novelty is the coating of the *papier mineral* with a film of collodion to protect it from being stained by the silver on the sensitive paper.

A number of very fine examples of the work done at the outdoor meeting in Cadzow Forest were then shown by Messrs. Annan (of Glasgow), Panton, Pringle, Matheson, Sinclair, &c., &c. Mr. Annan, who had worked wet collodion, showed some brilliant pictures—groups both of men and cattle. The cattle of both Messrs. Panton and Pringle, from dry plates, were also first-rate.

Two motions—one by Mr. Sinclair, that medals be given under certain conditions for the best work of the season taken at the outdoor meetings, and one by Dr. Nicol, that a medal be given for the best paper read before the Society—elicited a considerable amount of discussion; but both were ultimately withdrawn in order to enable the members to consider the subjects more fully.

The Secretary then reported that the Council had considered the letter from the Glasgow Photographic Association, requesting the cooperation of the Society in opposing the extension of Mr. J. W. Swan's patent for the manufacture of carbon tissue. The Council had fully considered the subject, and on the ground that the Society had invariably declined to entertain any question connected with the commercial aspects of photography, recommended that no action should be taken in the matter.

After considerable discussion it was resolved to approve of the report, and the Corresponding Secretary was instructed to communicate the resolution to the Glasgow Photographic Asssociation.

Dr. John Nicol, in the name of Mr. Gutekunst, of Philadelphia, presented the Society with a large portrait of Longfellow, of the same exquisite beauty as the smaller pictures shown by the same artist at the late exhibition. He also submitted for the inspection of the members a number of cabinet pictures, duplicates of those exhibited, and by Mr. Gutekunst's request invited the fullest criticism of all. He reminded the members that there had been considerable diversity of opinion regarding the quantity of retouching on the exhibits of Mr. Gutekunst, and that a large number of the members thought a mistake had been made in characterising the pictures as so worked upon as to place them out of competition with ordinary photographs. On the authority of Mr. Gutekunst himself he (Dr. Nicol) stated that, with the exception of the lady with the hat and beads, the whole of the specimens shown were untouched prints from untouched negatives, and, as most of them were duplicates of those in his case, the members might examine the pictures for themselves. He (Dr. Nicol) had done so very carefully, and had no doubt that they were really what Mr. Gutekunst claimed for them.

Mr. J. G. Tunny was glad of the opportunity of expressing his opinion of the wonderfully-beautiful pictures of Mr. Gutekunst. He had examined them particularly when they were in the exhibition, and was satisfied that there was very little retouching; in point of fact they did not require it. They were printed with extreme care from almost perfect negatives, and the system of glazing gave a depth and transparency that had, by its rare beauty, misled those who considered such an effect due to excessive so-called "modelling." He might add that that opinion had been fully expressed to one of the judges at the time of the exhibition.

Mr. W. Neilson expressed himself much pleased with the pictures, and quite agreed with Mr. Tunny in thinking that their extreme beauty had cast a doubt on the method of their production. A more careful examination, however, would make quite clear the fact that they were really nature's handiwork, as they possessed natural beauties which no retoucher could imitate, but which his work would certainly mar.

Dr. Hunter had never seen anything in photography at all approaching in beauty Mr. Gutekunst's pictures then exhibited. He was also very glad to find that the general opinion of the members was that they were photographs pure and simple, as it would be a stimulus to each to try and do work equally excellent. Good sometimes came out of evil, and for his own part he did not regret the little misunderstanding that had arisen, as it had probably led to the presentation of the noble head of Longfellow, which would be a lasting memorial of the exhibition; while the discussion would undoubtedly show that, in the opinion of the meeting, they were specimens of the highest class of pure photography. He proposed that the Secretary be instructed to convey to Mr. Gutekunst the best thanks of the Society for the very handsome gift he had forwarded.

The proposal was unanimously agreed to; and votes of thanks having been given to Mr. Laing and Mr. Turnbull, the meeting was adjourned.

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BRISTOL AND WEST OF ENGLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

The ordinary (and last indoor) monthly meeting of this Society was held at the usual place of meeting, the Museum, Queen's-road, Bristol, on Wednesday the 2nd inst., — Dr. Thomson in the chair. The minutes were read and confirmed.

The Secretary read a long expostulation from the Glasgow Photographic Association relative to the reply of the Bristol and West of England Amateur Photographic Association to that society on the subject of the carbon patent, and which caused some little merriment.

Colonel Biggs, of Bristol, was elected an ordinary member of the Association.

Dr. Thomson read a paper on *The Collodio-Albumen Process* [see page 222], which was listened to with marked attention, and which was illustrated with some very fine pictures.

Mr. E. Brightman asked if Dr. Thompson had tried moistening the film prior to development with alcohol, to avoid blisters.

Dr. Thomson stated that he had suffered scarcely at all from the film blistering.

Mr. Brightman congratulated him, remarking that most of the workers of the process found blisters a great enemy.

Dr. Thomson stated that to be quite sure that no hypo. was left in the prints he often soaked them in a solution of salt, which accomplished that end.

Mr. H. A. H. Daniel asked if he did not find that by so doing the tone of the picture was interfered with.

Dr. Thomson said he had not found that to be the case. He stated that many of those before the meeting had been so treated, and which certainly showed no signs of being reduced in tone.

After some further discussion the matter of the June outdoor meeting was considered. It was arranged that it should take place on the third Wednesday in June.

The Hon. Secretary stated that at the Council meeting, held a day or two previously, every other detail had been decided upon, the date simply being left open. He informed the meeting that Tintern had been decided upon as the destination, and that ladies and friends would be welcome, so that the excursion might be made as enjoyable and social as possible.

A hearty vote of thanks was accorded to Dr. Thomson for his most interesting paper, and the meeting was then adjourned.

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FRANKFORT-ON-MAINE PHOTOGRAPHIC SOCIETY.

A meeting of this Society was held on the 7th March,—Herr van Bosch occupying the chair. A communication from Herr Feilner relative to his method of cleaning old plates gave rise to a discussion.

Herr Feilner, in his communication, stated that he had almost entirely given up polishing plates, and that without making use of any substratum, such as gelatine or albumen, his plan was very simple:—When the plates have lain some time in acid they are carefully washed under a water tap, and are at the same time freed, by brushing, from any adhering dust or collodion film, &c. The plates are then placed in a plate-rack and allowed to drip, after which, while yet moist, they are placed in a large vessel containing distilled water. When removed from this dish they are well rinsed on both sides with distilled water, and are then set up to dry. The plates are now ready, after an ordinary dusting, to be coated with the iodised collodion. The water fogging and water drops which are often visible when one breathes upon the glass are perfectly invisible on the negative. It is, of course, understood that to produce good results by this method great care must be taken—especially that the operator must keep his hands very clean during the manipulation; but an earnest warning that a failure in this point will necessitate a return to the slow and laborious polishing will generally produce the desired result. Then the plate must be carefully freed from the spring water before it is placed in the distilled water. The writer referred at some length to the advantages and disadvantages of his method.

Herr **Abel** said he also cleaned his plates with water, but without alcohol or spirits.

Herr **Walther** observed that he cleaned off greasy matter by a solution of potash, then rinsed with spring water, and finally with distilled water. He was always sure of having clean plates.

There was no other matter of general interest discussed, and the meeting was shortly afterwards adjourned.

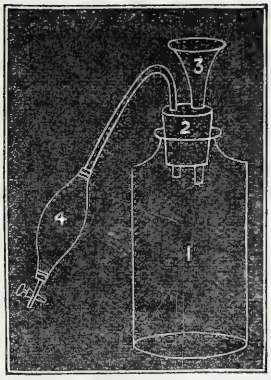
Correspondence.

May Meeting of the Photographic Society of France.—Presentation by M. Andra of Negatives Made with M. Chardon's Emulsions.—A Novel Filtering Apparatus by M. Comte.—A New Drying Chamber by Mr. Harrison, Junr.—An Ingenious Heliostat by M. Prazmowski.—A Discovery of Vegetable Gelatine.—M. Boissonnas' System of Reducing Exposure.—Presentation of Carbon Proofs by M. Braun.—The Progress of the Forthcoming Exhibition.

The Photographic Society of France held its monthly meeting on Friday last, the 4th instant.

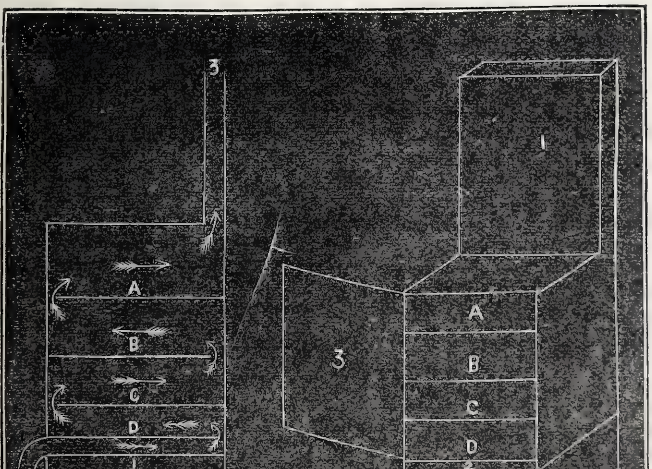
M. Andra exhibited some very fine negatives made with the emulsion process of M. Chardon.

M. Comte, a very old and distinguished member of the Society, presented an apparatus which, if not new, will render great service to many who find a difficulty in filtering syrupy liquids. No. 1 represents a bottle of any capacity whatever. No. 2 an india-rubber stopper having two holes. No. 3 a glass funnel with a tuft of cotton wool. No. 4 an india-rubber air-ball. No. 5 a stopcock. The solution to be filtered is poured into the funnel. The air-ball is pressed, taking care to open the tap, No. 5. The latter is closed, and the elasticity of the india-rubber ball draws a certain quantity of air out of the bottle. The atmospheric pressure then acting upon the surface of the liquid in the funnel forces it through the filtering-cotton, and thence into the bottle.



Mr. Harrison, Jun., presented to the Society the model of a new drying chamber for the desiccation of carbon tissue, gelatine emulsions, and dry plates. *Fig.* 1 represents a side view of the apparatus. At the lower part is a sheet-iron bottom, No. 1, which, being heated by a spirit or gas lamp, the cold air entering at No. 2 is warmed by passing over the hot plate, and follows the direction of the arrows until it makes its exit by the chimney at No. 3. *Fig.* 2 represents the front of the apparatus. A B C D are the shelves upon which the objects to be dried are laid. The door No. 3 is closed. This door, pressing against the shelf B, closes the communication and compels the air to take the direction of the arrows, as seen in *fig.* 1.

FIG. 1. FIG. 2.



M. Prazmowski presented a very ingenious optical instrument which will be of great value to those engaged in photomicrographical researches. The photographing of small and invisible objects presents great difficulties; generally micrographical images are made by the aid of the sun's light, and require that the rays of that orb be immobilised. This result is secured by a heliostat—an instrument at the same time very expensive, very friable, very complicated, and very difficult to regulate in a satisfactory manner. These reasons instigated M. Prazmowski to endeavour to invent a new instrument, and he has succeeded in inventing a heliostat at the same time more simple, very easy to regulate, and at a low price. The instrument is no larger than a small timepiece, and will be a very valuable aquisition for photomicrographical observation.

A very interesting presentation was made to the Society by M. Stenfort. This gentleman, in pursuing his botanical studies, discovered that certain seaweeds, after having been dried and finely pulverised, could be redissolved in water, and that the product, when poured upon a sheet of glass in the same manner as collodion, and allowed to dry, would give a very tenacious film, and replace with advantage the ordinary gelatine. "If," said he, "539 grammes of the pulverised seaweed be taken and dissolved in 15·400 grammes of water, and then poured upon a sheet of talced glass, a very solid film will be the result. This film can replace with advantage the lithographic stone for fatty-ink impressions, and for the carbon process it will be of great value." A great advantage, in my estimation, which this vegetable gelatine has over the other consists in its not being so easily acted upon by atmospheric changes as the ordinary gelatine. It appears that it takes and holds all kinds of dyes with extraordinary tenacity; but I must confess that it has not the fine appearance of the gelatine as sent out by certain manufacturers. Naturally, as this is a very recent discovery, there is time for its improvement. At present its clarification presents great difficulties, but no doubt these will soon be overcome. The specimens laid before the Society were of divers colours. Some were printed upon, and others were employed as transfer sheets. The whole of them were very tenacious, and more of a leathery appearance than otherwise.

A new product has now come into the market. It will soon be seen what advantage it will be to the photographic art. All photographers are occupied with the amazing results obtained by M. Boissonas' system of reducing the time of exposure. Up to the present I would not give credence to all that was advanced in favour of his process, the more so that it was a secret process, and only demonstrated to those who would pledge themselves to divulge it to no one. But the other day I was obliged to become a convert to its value, as M. Franck de Villecholle and M. Joliot—two of our best photographers, who had purchased licenses—declared to me that they were highly satisfied with their acquisition and with the results they could obtain with the process. Moreover, I saw some instantaneous portraiture made with this process which was truly worthy of notice—children, some laughing, some crying, others playing with living animals, yet all taken in so natural a manner as to render the picture highly pleasing.

M. Braun presented the Society with a collection of carbon prints—reproductions of the most celebrated pictures of the Museum of Amsterdam. The proofs were very much admired, the tones being very harmonious and brilliant; in fact, M. Braun has made great progress in the manufacture of carbon tissue within the last few months.

M. Geymet, the indefatigable populariser of fatty-ink printing, presented the Society with a great number of proofs in fatty ink intended for the *Bulletin*. The picture represents a little *chalet* with two gentlemen sitting at the window. In the garden another gentleman is reading the paper. In all, although there are some very good half-tones, the quality is far behind what I have been accustomed to see turned out by M. Geymet. I fear that this gentleman, in seeking after quantity, leaves quality a little to take care of itself. May this little friendly warning induce him to return to the old way which he honoured so much—"little, but good."

M. Duchesne presented a piece of clockwork mechanism for the studio which was made to beat the seconds in a very regular manner, and to strike whenever the hand arrived at twelve, it being immaterial at what part of the circle the operator had placed it. Unhappily, although a celebrated constructor present endeavoured to set it going, it was completely rebellious, and consequently gained for itself a bad character among the members present.

Decidedly Italy makes rapid strides towards perfection. M. Alinari, of Florence, sent some magnificent proofs for the inspection of the Photography Society of France. I learn that they are intended for the photographic department of the great exhibition.

I paid a visit to the Champ de Mars last Sunday, and was agreeably surprised to see with what wonderful rapidity the immense palace intended for the forthcoming exhibition is being proceeded with. French photographers are looking forward with pleasure to, and are working with energy for, the forthcoming friendly struggle. My advice to English photographers is to do all in their power to prepare for the coming ordeal. I am certain that they will be all received by their photographic brethren on this side of the water with the courtesy and the great display of friendly demonstration so congenial to their character.

3, *Place Bréda, Paris, May* 8, 1877. E. Stebbing, *Prof.*

TILTING THE CAMERA.

To the EDITORS.

GENTLEMEN,—Your correspondent "Syntax" cannot have carefully read either of my communications on the subject of a swing back or front to the camera. He says I make objection to his plan on practical and theoretical grounds. I have done no such thing. In theory he is perfectly correct, and in practice it might be advisable to adopt his plan in a new camera. My object in writing my letter of the 12th April was to prevent persons having either a swing back or front from altering it, and then finding they "had gained nothing by so doing."

I highly approve of a swing for many purposes; but, as photographers in general do not take views from the tops of mountains, they are perfectly useless in ninety-nine cases out of every hundred. I hold it to be a great mistake to get *immediate* foreground and mid distance both perfectly in focus; it is quite unnatural, and every portion of a picture commencing twenty or thirty feet from the camera will be perfectly sharp without any inclination of the plate.

"Syntax" says that a hinged front cannot be lowered. I have three swing-front cameras embracing that movement, and consequently I scarcely ever use the swing. I have a great horror of converging lines, and for *very* high buildings occasionally find the swing very useful; when, therefore, there is any probability of finding such subjects my movable swing-back may be taken out without much inconvenience. For an 8 × 5½ plate it measures 9 × 7, is one and three-quarters in thickness, and weighs five ounces.—I am, yours, &c.,

Cheltenham, May 7, 1877. BAYNHAM JONES.

◆

EXCHANGE COLUMN.

I will exchange a handsome pedestal and balustrade for anything useful in photography.—Address, A. LEE, 4, Prince's-buildings, Bath.

THE BRITISH JOURNAL OF PHOTOGRAPHY, bound, for the years 1871-2-3-4, also half-plate Dallmeyer studio camera, in exchange for good *carte* lens, quick acting.—Address, W. J. SMITH, 200, Bell Barn-road, Birmingham.

◆

ANSWERS TO CORRESPONDENTS.

PHOTOGRAPHS REGISTERED—

Peter Greenhalgh, Farnworth, near Bolton—*Two Portraits of Henry Vincent.*

Patterson and James, Ramsey, Isle of Man—*Five Portraits of Oronhyatekha, LL.D.*

☞ *Correspondents should never write on both sides of the paper.*

W. E. M'CALLUM.—The "Photographers' Benevolent Association" is the only Society of the kind existing in this country.

E. B. L.—The negative has arrived in such a fractured condition as to render it impossible to discover the effects to which you allude. What is the nature of the markings?

M. N. O.—Let us know the quantity of silver present in each gallon of the washings, and we can then inform you the precise quantity of salt by which it will be precipitated.

J. G. G.—1. There is no necessity for obtaining the signatures of the persons forming a group.—2. If you furnish particulars we may possibly be able to ascertain the required date.

OBLIGED READER.—The plan for a studio will answer very well with one exception—the side D must be two feet lower than than it is now shown to be, and the glass must be carried down to the eaves.

A. MARCHANT.—We regret our inability at present to devote time to writing further on the topic mentioned. Much information will be found distributed throughout the former volumes of this Journal.

A POSITIVIST.—Although a solution of asphaltum in benzole makes an excellent black varnish, it is much better to add to it a small proportion of india-rubber solution, which will lessen its liability to cracking.

SHEFFIELD AMATEUR.—Your condenser will answer well for producing enlargements. If you compare its form with those described in our last ALMANAC it will be found that this form is spoken of in terms of commendation.

OLD FILE.—Albumen that has been prepared for the Fothergill process contains too much water to be of any use whatever in the negative albumen process. For this purpose the albumen must be as strong as possible, so as to ensure a good body in the film.

L. O. S.—1. The elevations and depressions in a gelatine picture might possibly be exaggerated by moistening it, and, while swollen from this cause, taking a cast from the surface.—2. By mixing a semi-opaque powder with the gelatine the desired effect will be produced.

KENSINGTONIA.—Certainly; the ammonia precipitates the silver in the form of oxide. This oxide, however, is soluble in excess of ammonia; all, therefore, that is required is to add ammonia to the solution of nitrate of silver until the precipitate first thrown down is redissolved.

W. B. RAY.—Filtering paper of the usual commercial kind will be found quite suitable for the filtration of collodion; but if the latter be thick the operation will necessarily be a protracted one. We have employed felt for this purpose with great advantage, and we can strongly recommend its use as an agent for filtering.

THERMOMETRIC DEGREES.—In reply to what the "Peripatetic Photographer" has said concerning the estimation of temperature by "percentages," Mr. C. Witcomb, to whose article allusion had been made in passing, informs us that by a slip of the pen he wrote the words "per cent." instead of *Fahrenheit*. This ought to have been palpable to every reader, although it does not appear to have been so to the "Peripatetic Photographic."

G. S. S.—First make your nitrate bath neutral or even slightly alkaline before placing it out in the sun. It is doubtless owing to the omission of this that you have not succeeded in precipitating the organic matter. If time be of importance place the bath in an earthenware vessel and boil it for about twenty minutes.

CHUTNEE.—We are unable to offer advice as to whether teak or mahogany is the better wood of which to construct a camera for India. We are, however, aware that our best metropolitan camera-makers construct cameras for India of mahogany, and from this you may form some idea as to their opinions on this matter.

J. W. L.—1. By such treatment the bromide will *not* be converted into iodide. The solvent power exercised by ammonia upon bromide of silver renders this an easy method of distinguishing between bromide and iodide of silver.—2. We have not read Mr. Hardwich's remarks, but shall endeavour to obtain a copy of that edition of his *Photographic Chemistry.*

B. M'DONALD.—Let the question be tested and decided in the following manner:—Having ready a ten-grain solution of tannin collodionise and excite a stereoscopic plate. Wash thoroughly and divide into two portions by a diamond. Apply the tannin solution to both; after a couple of minutes wash one plate thoroughly, and allow the other to dry without the tannin being removed. Now expose and develope, and the resulting negatives will answer your query.

R. P.—1. In one of the largest photolithographic establishments* in this country A is, by one of the men, preferred to all others; but another, of equal experience, gives the preference to G. There is no practical difference between D, F, and H, and we should give any one of *them* the preference over the others. You will be quite safe with any of the articles mentioned except J, which is unsuitable for the highest class of work.—2. The Schlippe's salt method of intensification will prove very satisfactory.

J. S. R.—We cannot here give directions for preparing a *camera lucida;* they will be found in most treatises on optics. The ray undergoes a double reflection. A prism is not absolutely necessary, as the double reflection can be obtained by means of two small reflectors adjusted to each other at the proper angle. We imagine that there would be almost less trouble in grinding the prism than in silvering and adjusting the reflectors. There are several professional prism makers in this country from whom you could be supplied at a cheap rate with all that you require.

X. Y. Z.—The aniline process of Mr. Willis is altogether different from the platinum process of the gentleman of the same name, and who bears a filial relationship to the other. We are able to give you the formula for preparing the paper, but we must premise that it is the subject of a patent which has still two years to run, and in connection with which it is said that no licenses are granted. Sensitise the paper by brushing it over with the following:—

Bichromate of ammonia	30 grains.
Dilute phosphoric acid	1 drachm.
Water	1 ounce.

The paper is dried in the dark, and exposed under a transparency for about a fifth of the time required to produce a silver print, and it is then exposed to the vapour of aniline until a bold and vigorous image is produced, after which it is rinsed in water acidulated with a few drops of sulphuric acid, followed by a rinsing in plain water.

RECEIVED.—*Descriptive Catalogue of Astronomical Instruments* manufactured by Mr. Howard Grubb, Dublin; also *Medical Batteries, and How to Use Them*, by Harry Lobb., M.R.C.S.

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PHOTOGRAPHY IN COURT: PHOTOGRAPHIC CLUBS AGAIN.—At the Westminster County Court, on Tuesday last, the 8th inst., before Mr. Judge Bayley, the case of Hutchinson *v.* Paul was heard, in which the plaintiff, a government clerk, sued the defendant, a photographer, of Vauxhall Bridge-road, to recover the sum of one guinea, being the amount of money paid to the defendant, who was the proprietor of the Pimlico Photographic Club, under the following circumstances:—The plaintiff said he was attracted to the defendant's club by an excellently-executed and elegantly-framed portrait in a public house. Below the picture it was announced that a portrait exactly similar, together with twelve *cartes de visite*, would be supplied to subscribers of one guinea, which sum the plaintiff said he had paid by subscriptions at various times. When the portrait and *cartes* were sent home they were very imperfectly executed, and not finished so highly as the portrait he had seen; he, consequently, returned the pictures and demanded the return of his money, when the defendant became very insolent and ordered him out of the premises. Evidence was given by a photographer that the portraits were by no means equal to the specimen exhibited; and he, as a practical man, would not have sent them out. The defendent called two witnesses, who said the portraits were quite equal to the specimen exhibited. The Judge said these cases were constantly occurring, and it was a pity that photographers did not endeavour to fulfil their contracts; then there would be no dispute. In this instance there was a decided breach of contract on the part of the defendant which could not be overlooked, and as the pictures were produced in court he should certainly, on their evidence alone, give judgment in favour of the plaintiff for the amount claimed, with costs.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 889. Vol. XXIV.—MAY 18, 1877.

ON PRECIPITATED PYROXYLINE.

We have had to make very frequent mention during the last two or three weeks of the preparation which forms the subject of this article in connection with the new emulsion process of M. Chardon, and as we foresee that it may probably play an important, or, at least, a useful, part in the photography of the future we propose to give some account of its preparation and properties. It will be remembered that we devoted an article to the same subject in our number of the 18th August last year, and the experience there recorded varied rather materially in some points from the results of our more recent experiments, though, it is true, an entirely different line of research was adopted in each case. The difference in the physical character of the product now obtained is due chiefly to modifications in the manipulation; but it is quite possible that slight variations may occur when operating upon different varieties of pyroxyline.

It may be worth while to consider the not unimportant question of expense, and to inquire whether the additional outlay brings with it an adequate benefit; for, if this be not the case, it is obviously unwise to incur unnecessary cost and trouble. We may at once state our belief that, except for emulsion purposes, the advantages are not sufficiently marked to render the adoption of the new preparation either necessary or judicious, as for all the purposes of wet or dry collodion to be sensitised in the bath pyroxyline of good and suitable character is easily obtainable at a moderate cost. But in the preparation of gun-cotton for emulsion purposes special features are required, and greater care in adjusting the temperature and strength of the acids is necessary in order to secure the best results. Pyroxyline possessing the requisite properties is by no means so easily obtained as the ordinary sort, and when obtained its price is comparatively high in consequence of the greater care given to its preparation. Precipitated pyroxyline forms at once, if properly made from even the cheapest materials, not only a perfect substitute for the high-priced samples usually employed, but for some purposes gives an altogether superior result, and this at an actual cost very little, if any, higher than that paid for the non-precipitated cotton.

As an example, take an actual experiment made with the object of testing the question of comparative cost. We commenced with a sample of pyroxyline which is sold at sixteen shillings per pound; it is very soluble and gives little or no residue, but is of little use for emulsion work. Of this four hundred grains were dissolved in a mixture of ten ounces of methylated ether, s.g. ·730, and ten ounces of ordinary methylated spirit, retailed at five shillings per gallon. The resulting collodion, after standing for a couple of days, though very thick, as might be expected, was tolerably clear except for the presence of a few floating specks and particles of dust, which were removed by passing it through muslin. This was poured into cold water, and the precipitate, when washed and thoroughly dried, weighed 368 grains, or exactly eight per cent. less than the original cotton. It is needless here to go into the details of the calculation; but it will be found that, reckoning the price of the ether used at half-a-crown per pound and the other materials as named above, and allowing for a loss of ten per cent. in weight, the price of the precipitated pyroxyline would be as nearly as possible three shillings an ounce against half-a-crown—the minimum price charged for high temperature cotton suitable for emulsion work. The manufacturer, buying upon more advantageous terms, could possibly afford to charge a little less; at least we see no reason why that price should not be remunerative, as the extra trouble is comparatively small. We should remark that the product of this experiment is equal, and in some respects superior, to the best ordinary cotton we can procure.

We shall now briefly describe the method of precipitating the cotton, premising that the operation presents no difficulties if only the right method be adopted, which consists solely in the manner of pouring the collodion into the water. In our former experiments we adopted the *wrong* method; for, in order to avoid loss of material (an end, by the way, not attained), we poured the collodion gently on to the surface of the water, stirring it gradually in, so that the solvents might be removed by slow diffusion without disintegrating the precipitate to too great a degree. By this means we obtained a tenacious, leathery mass, very difficult of management, which required several hours' soaking to remove the whole of the ether and alcohol, and which, when dried, became so hard and impenetrable as to be extremely difficult of solution. The proper course to follow, as laid down by M. Chardon, is just the reverse of this: the collodion is poured into the water in a thin stream—preferably from a height—and is stirred vigorously during the time of pouring and for a minute or two afterwards. By this means it is broken up into innumerable drops, each of which, immediately it comes in contact with the water, is converted into a distinct spongy mass or flock, being deprived almost instantaneously of its ether and alcohol. The stirring is continued as long as the mass exhibits any cohesive tendency, and when it feels firm and harsh to the touch it may be known that the removal of the solvents is complete. The water is then changed, the cotton pressed through a cloth, and dried.

The same mode of treatment is to be adopted whether hot or cold water be used; but, in the former case, the collodion must be poured more carefully, as owing to the rapid volatilisation of the ether the contents of the vessel will be liable to spurt into the face of the operator if too hurriedly done. The physical properties of the precipitate differ under the two conditions, the precipitate being lighter and bulkier with hot water, owing to the sudden evaporation of the ether bursting the skin which first forms when the collodion touches the water. Otherwise we cannot find with a given sample of cotton that it is of much importance whether the precipitation is performed with hot or cold water. The weight of the resulting precipitate does not differ materially, nor is its comparative solubility affected; it is possible, however, that a careful examination may establish a difference in the structural character of the films obtained from the two descriptions of cotton. It is true M. Chardon directs that the *coton resistant* and *coton pulverulent* are to be precipitated—one with hot and the other with cold water; but it should be borne in mind that the original formulæ by which the pyroxyline is prepared differs in each case.

We have previously remarked that it is unnecessary to employ solvents of the same quality as those used for ordinary collodion or emulsion. Except so far as it affects their solvent action we imagine it is of little consequence what proportion of water is present; practically we find no difference in the result whether absolute alcohol or common methylated spirit be used, and the low price of the latter renders it far preferable. We have employed wood naphtha in place of the spirit, in consequence of its greater solvent power when mixed with a small proportion of ether; but we are inclined to believe the resulting precipitate is different in character, as we have noticed an opalescent appearance in the collodion made from such pyroxyline, which is not the case when alcohol is used. As regards the proportion of cotton to solvents we can say but little, as it will depend greatly upon its solubility. We may remark that, while on the score of economy it is desirable to prepare a thick collodion, it is not advisable to carry the economy too far; the collodion should be thin enough to deposit its sediment in a reasonable time and to flow easily and in a fine stream into the water, otherwise the precipitate will be coherent and difficult to wash.

In order to avoid waste in washing and drying, and to facilitate the operation, it will be found convenient to employ a conical bag fixed upon a hoop of thin cane. When the precipitation is complete the whole of the contents of the vessel are transferred to the washing bag, and, after passing two or three pints of water through to remove the last traces of ether and alcohol, the mass of cotton is squeezed as dry as possible, and may then be removed in a lump; it is then broken down with the fingers or a spatula upon a clean porcelain dish, and dried at a gentle heat on a water bath. When quite dry it should present the appearance of light flakes of pure white and easily reduced to powder; it dissolves as rapidly as ordinary pyroxyline, and if carefully prepared gives at once a perfectly-bright solution of a faint yellow tinge. It gives upon glass a hard, smooth film, non-contractile, and yet differing totally from the so-called "powdery" films commonly spoken of in connection with dry plates.

The general idea with regard to this preparation is that it consists of ordinary pyroxyline *minus* those portions soluble in water; but this theory will not sufficiently account for the entire change which occurs in the character of the product. We cannot enter into any explanation of that change, beyond reminding our readers of the result of M. Blondeau's analysis of precipitated cotton made nearly a dozen years ago. That gentleman states that pyroxyline precipitated from its solution in ether and alcohol takes into combination about eight per cent. of water, and, considering the important effects exercised upon the structural character of the film by the proportion of water present in the collodion, such an alteration in the composition of the pyroxyline itself must bring about changes of a much more decided nature.

We are not in a position at present to add to what we have already said when speaking of M. Chardon's process in favour of the new pyroxyline in emulsion; but we can recommend it to our readers as a valuable addition to our resources.

A HITHERTO UNRECOGNISED PHASE OF COPYRIGHT.

To those who are at all dubious concerning the interpretation of the Copyright Acts in relation to the influence exercised by registration on their being carried into legal effect, it is matter for congratulation that on Saturday last a case was decided which will throw much light upon a phase of the subject upon which no judicial opinion had previously been pronounced.

At starting we may premise that the case to which we refer is typographic rather than photographic—that it belongs to the domain of literature rather than to that of art; but there are broad principles underlying the decision which render it a matter of great interest to photographers.

The case may be briefly stated as follows:—A copy of a certain work had been sent to the *Morning Advertiser,* which paper published copious extracts from it without making such full or definite acknowledgment of the source of supply as was satisfactory to the publisher of the work in question. Thereupon ensued an action for infringement of copyright, which was tried before Justices Mellor and Field on Friday and Saturday last.

Among the replies to the allegations of the plaintiffs it appeared that the book itself (entitled *Benjamin Disraeli, Earl of Beaconsfield)* was composed of extracts from newspapers and other sources; that at the time the *Morning Advertiser* published the extracts in question the book had not been entered at Stationers' Hall; and that this step, which was necessary in order to constitute legal copyright, was only taken after the offence had been committed and immediately previous to the action being brought.

In the reply and demurrer which were put in to meet these pleas it was stated that it was not necessary, in accordance with the provisions of the Act, for the plaintiffs to have made an entry in the book of registry of the Stationers' Company prior to the commission of the alleged infringement; that it was sufficient if such entry were made prior to action brought for such infringement; and that the exercise of diligence, research, industry, and skill in the collection, arrangement, preparation, and editing of a publication, the matter of which was derived from various sources, constituted the work which resulted therefrom a compilation which was entitled to the protection of the Copyright Act.

It was in the former of these demurrers that the great struggle was expected to take place; for, curiously enough, it is one of those points in copyright law that has never previously been brought before a judicial tribunal. The case was argued with much skill, as it was felt that it would be a precedent in all similar cases in future. It has always hitherto been assumed, but never before decided by the court, that, in order to establish a case of literary infringement of copyright, it was essential only to register at Stationers' Hall *previous to bringing the action.* The counsel for the plaintiffs took this view, and contended that registration was not needed to confer or establish a copyright in any work, but was solely useful as an initiatory step in suing to recover damages as respects any infringement of copyright held to exist, although irrespective of registration; and that, in short, registration could be made of a work the copyright of which had been infringed long previously, and legal proceedings initiated within half-an-hour after such registration.

The opposite view was taken by the Solicitor-General, the counsel for the defence. He contended that it was only in accordance with reason and common sense that an entry should be made in the Registrar's books in order that any person, before publishing a work, should be able, on referring to the register at Stationers' Hall, to see whether or not a copyright in it existed; and he expressed an opinion that such was in the minds of the legislature at the time the Act was framed.

The great importance and novelty of the case were fully admitted by Mr. Justice Mellor, who expressed his perplexity at some apparent injustice or difficulty which might arise from taking the literal construction of the sentence in the Act which dealt with registration. It was very evident, however, by the terms of the Act that registration was *not* necessary, except for the purpose of completing the machinery enabling an action to be brought; and the proprietor of a copyright was not bound to register until about to commence an action or suit for an infringement of an existing copyright. It was, he alleged, impossible to construe the words of the Act in any other sense than that it was a condition to the bringing of the action or suit, and not a condition to the existence of the copyright. The words of the proviso are:—"Provided always that the omission to make such entry shall not affect the copyright in any book, but only the right to sue or proceed in respect of the infringement thereof." After a trial occupying two days a verdict was given in favour of the plaintiffs on both counts.

The Act under which photographs are registered differs in some important respects from that which has just received such prominence. Under that Act no action can be maintained for any infringement previous to registration.

PHOTOGRAPHING MACHINERY, &c.

This not very poetical branch of photography is one of considerable importance to those who make a speciality of it, and it is a very lucrative one; yet, from fancied or real difficulties in the way of its practice, there are few who have made themselves sufficiently proficient in it to be able to set to a morning's work at machinery with pretty good assurance of success.

It is very common, in giving advice about any special branch of photography, to lay stress upon the necessity for the bath being in thorough working order for the particular purpose in question, and the present case forms no exception to the rule; for under no circumstances is it more necessary than for the class of work of which we are treating. The exposure may be from a minute to a couple of hours, and the temperature range from the winter cold of an ice-house to the tropical heat of a shed of blacksmith's forges, where any irregularity in the bath would be fatal, and result in stains and oyster-shell markings innumerable. To execute this class of work successfully every contingency must be provided against—not alone in the direction of chemicals, but in apparatus equally as well. A swing-back camera is indispensable. It frequently happens that the object to be photographed is in such close proximity to the camera itself—some portions of it lying in a plane oblique to that of the camera back—that accurate focussing can only be thus obtained, unless a stop of such diminished aperture be made use of that the exposure becomes so long as to introduce too many elements of non-success. Again: the usefulness of a swing-back will be seen when an object of regular form lies on the ground close to the camera, which latter has to be tilted to get the object in the field of view at all. Here a swing of the back—the top outwards—prevents all want of truth in the perpendiculars, and there will be no fear of the result representing a truly-constructed machine with sloping sides and irregular contour.

For the successful prosecution of this class of work a good selection of lenses is necessary. The size of the picture required is generally fixed upon beforehand; and as the standpoint is often of limited area, if not absolutely fixed, there are not afforded the opportunities that landscapists enjoy in the selection of their point of view. The lenses, it must be remembered, should be chosen for their focus—not from their being wide or narrow-angled, quick or slow. Let the latter qualities, of course, govern one in deciding; but the focus of the various lenses should so rise, step by step, that, wherever the point of view may be chosen or fixed upon, one lens may be found amongst the series which will take the picture the required size. The lens selected, the diaphragm used should be the largest it is possible to employ with the aid of the swing-back.

It will frequently happen that the object to be photographed lies at one end of a dark workshop. It would, then, be greatly conducive to rapidity and excellence of results if it could be brought forward, perhaps, into the open air; for it very commonly happens that the windows or skylights which illuminate such places are covered over with a fuliginous deposit, which seems to rob the light which passes through them of every particle of actinic power.

At this point it will be well to mention a very useful wrinkle. It will be impossible to get a very satisfactory picture of an iron casting, or, indeed, any metallic object which is not finely polished, unless it be purposely painted beforehand in a special manner—that is, with turpentine flatting—a light slate colour being the tone most advisable, as its photographic value can be seen at a glance, without the chance of miscalculation which a green or a brown, for instance, might offer. This will be found to be a matter whose usefulness cannot be too highly valued. The contrast between a machine, no matter how excellently photographed, which has not been specially painted and the same subject with a coating of the "flatting" will be so great that no one who has once seen the two would think of photographing an unpainted piece of ironwork if he could possibly avoid it. There is one precaution to be taken in laying the colour on which, though it is more especially the painter's province to look after, may be pointed out here: it is that it should be made with so little oil or gold size that it will not dry "patchy" or "cloudy"—that is, with some parts dead and some bright. The effect then produced would be worse than if the machine had remained untouched.

During the exposure care must be taken that no workmen are allowed to lounge about and smoke; for it is remarkable what a small amount of smoke will suffice to fog a picture if it blow across the field of view, this being due, no doubt, to the highly-actinic quality of the light reflected from the minute particles composing the smoke. We once had an otherwise excellent negative ruined through a similar cause, but from another source. The wind was strong, and carried a puff of smoke from a neighbouring office chimney right into the open doorway of the room in which we were photographing; it permeated the whole atmosphere of the place, and rendered it impossible to secure a clear negative, though at the moment the occurrence was not noticed.

When the negative is obtained it will generally be found that the background will be required to be eliminated, plain white paper being generally preferred by manufacturers to show off the peculiarities and excellences of their machines, there being then no chance of confusing their details with those of the surrounding machinery in the background. To stop out all these and leave a white background we have tried a multitude of expedients, but find no plan better than to make an edging of about half-an-inch by means of Bates's black varnish, carefully following the outlines of the machine as accurately as possible, and then placing a paper mask to block out the whole of the ground left outside this edging. This plan reduces the risk of cracking from the black varnish, and is at the same time more expeditious. We have tried India ink, gamboge, and water colours *ad libitum;* but we find it most difficult to obtain the requisite "body" to stop out all the light so as to avoid any stain or streak.

We trust that the few points we have touched upon may tend to render this class of work easier to those intending to try it, and we advise all, from a pecuniary standpoint, to do so when the occasion offers; for it is certain that in time to come photography will be more and more in request for work of this description, and we are in a position to state that, even in small establishments, the annual expenditure for photographs of machinery forms a conspicuous item.

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The difficulty of producing vignetted carbon prints has always been acknowledged. A most effective printing-frame—or, rather, a series of printing-frames—which enables this branch of carbon printing to be carried out in a manner so sure and simple as to be almost mechanical, has been submitted to us by Mr. E. Greaves, of Halifax, who has demonstrated to our entire satisfaction the efficiency of his apparatus for producing charming effects in vignetting. As the invention has been protected by patent we shall abstain from entering into details until the specification is thrown open to the public; but, meanwhile, we may state that it consists of a combination of several previously-known appliances specially framed with a view to the requirements of carbon printing. For example: the ordinary vignetting mask, which is constructed of wood with a bevelled aperture, and by means of which a vignette with a white margin is obtained, is used with a counterpart in which a mask, having also a bevelled edge, is employed to protect the picture (which is supposed to be already printed), and to expose the margin so as to impart to it a tint of any desired degree of depth, this "tint" being vignetted or graduated so as to merge into the picture. The pressure-pad or cushion forming the back of the printing-frame is composed of an air-chamber made of india-rubber, with an appliance by which it can be distended with air to impart any required amount of pressure. We recognise to the fullest extent the excellent manner in which the new printing-frames are calculated to render important aid in the special department of artistic labour in which they are intended to be utilised.

In spite of the rapid strides made by carbon printing during the last few years, and its very general adoption in all first-class studios throughout the country, there can be no doubt that a very large number of photographers, both professional and amateur, will continue for many years to come to pin their faith to silver. To those Mr. J. A. Spencer's article last week will come as a touch of encouragement, for that gentleman shows that silver prints are not necessarily the evanescent productions which many assume them to be. It is, however, painfully true that, in the face of all care and precaution, silver prints do occasionally fade in a most unaccountable manner, while without such care fading is, we need scarcely say, the rule. An examination of a number of prints of old date has brought Mr. Spencer to the opinion that the employment of fresh albumen only is a safeguard against fading. We, too, have been recently overhauling our stock of old prints, and, like Mr. Spencer, find that, while among those printed ten or a dozen years ago fading, in the strictest sense, does not show itself and loss of brilliancy and tone is the exception; those printed only so far back as six or seven years exhibit both defects abundantly. Without attempting to explain the absolute cause of this difference, we may mention one or two particulars respecting the production of these prints which may possibly agree with the experience of others in throwing some light upon the mystery. The earlier pictures were invariably produced with a strong bath, which was never allowed to register less than fifty grains to the ounce. About eight years ago, in consequence of the agitation in favour of weak baths, fortified by the addition of nitrate of soda, nitrate of copper, sugar, and other substances, we were induced to adopt in turn one or other of the modifications, and continued to use them for some years, until compelled to relinquish them for reasons unconnected with the permanence of the results. Various toning formulæ have been employed, but the only one we can identify with any particular period was that published by Mr. Bovey (we think) in 1868, and consisting of a very weak solution of gold and common salt. Prints dating from this time do not compare favourably with the earlier ones. Up to 1869 the prints were washed, after fixing, in an earthen vessel, the water being changed frequently during a period of ten or twelve hours, and then immediately dried. In 1869 we had constructed a self-acting washing trough, in which the prints were frequently allowed to remain untended for a much longer time. We may mention that for a considerable time during 1865-6 the only paper used was a thin sample of Rives, of very brilliant surface and abominable smell; but, contrary to Mr. Spencer's opinion, the prints of that period show but little trace of fading. We will conclude with an instance of persistent permanence under the most unfavourable conditions, which we have on the authority of an amateur friend:—A lady having wrung from him the gift of an unmounted portrait of himself which he scarcely thought did him justice, in order to ensure for it a brief career he immersed it, before mounting, in the ordinary fixing bath, damped off the surplus, and dried it. Obtaining access, over twelve months afterwards, to the album containing it, he was surprised to behold it in its original state, without the slightest sign of fading.

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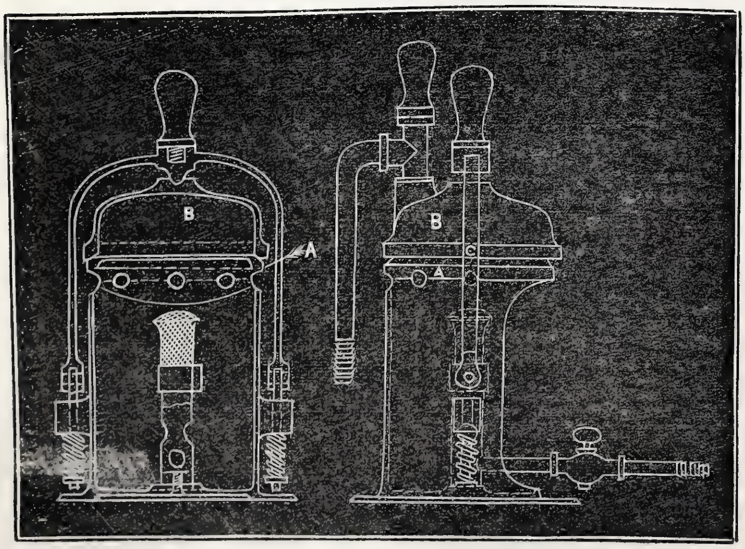
SAFETY OXYGEN GENERATOR.

Since I introduced to the meeting of the Manchester Photographic Society, two months ago, my oxygen generator, I have thought proper to modify its construction, making it into a safety apparatus, by the use of which explosions or accidents are next to impossible.

The retort or generator is very similar in form to that at first introduced, but the difference is in the mode of fastening. From the accompanying diagrams, *figs.* 1 and 2, it will be seen that the retort is formed of two pieces—a flat plate A and a cap B, the latter of which has an aperture at the top, into which is screwed a pipe for conveying away the gas. In other respects they are two simple castings, ground to a gas-tight fit (a very simple matter), and, *if ever required*, can be renewed at a cost of about half-a-crown.

FIG. 1. FIG. 2.



The cap B is weighted by two spiral springs at the extremities of the bow C to about seven pounds dead weight, which on a three-inch diameter retort is equal to one pound pressure per square inch, or twenty-seven and a-quarter inches water pressure, and, as it is not usual to use more than from five to six inches of water pressure (or less than a quarter-pound per square inch) in a gas-holder for oxyhydrogen lime-light, I consider the one pound sufficient margin for excess.

Now, it is obvious that, if the passage from the generator to the gas-holder be stopped up, either by omitting to open the tap or from any other cause (such *has* been the case, and in some instances nearly caused fatal accidents), the pressure in the generator would soon rise, and when it had arrived at the one-pound pressure would lift the cap and allow the gas to escape—on the same principle, exactly, as the safety-valve of a steam boiler, but with less force; for one pound pressure out of a three-inch diameter safety valve would be hardly noticeable.

Now, as soon as the passage is again clear the gas would take its right course, relieving the pressure inside the retort, and by virtue of the springs the top would assume its original position. This method of weighting the retort by springs forms an excellent mode of attachment.

To open the apparatus pull over the wooden handle which is fixed on the top of bow C, and the cap B may be lifted off by the handle thereto. For closing the retort reverse the operation, which is almost instantaneous, and far superior to any method of screwing.

It will be seen that I use an ordinary Bunsen burner. Wallace's, with a perforated cap, I find the best, the heat from which is generated far above the springs, which act as weights, and therefore are not likely to get hot and lose their temper.

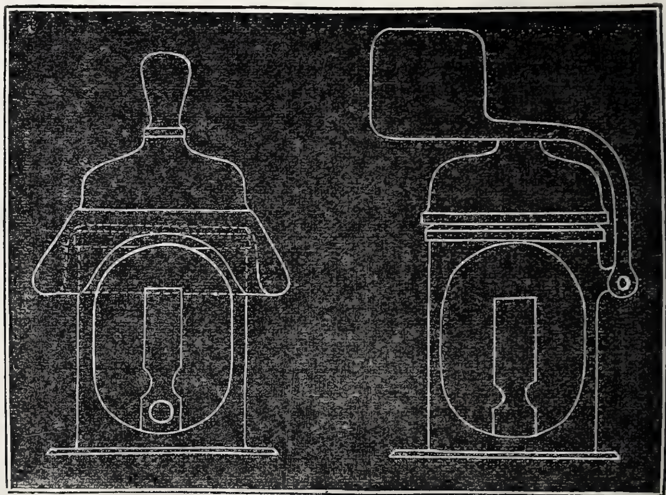
The chlorate of potash and manganese are mixed and formed into cakes, which, when dry, are quite hard and not at all fragile, as some people have supposed. They are extremely clean to handle, and the making of them is not the "dirtiest of dirty jobs;" for, with a basin, a knife, a mould, and a little gum water, they can be made almost without soiling the fingers.

Since I first introduced the cakes I find that the substratum of manganese is not necessary, as, if the cakes are dry, they do not stick to the apparatus objectionably, being only in contact with the retort bottom, which is made convex, so that the cakes shall not bear all over. By this precaution the spent cakes may be removed from the retort in their entirety—slightly distended, but otherwise in their original form. As more chlorate of potash can be got into less bulk in the cake form than loose powdered chlorate, it is obvious that more gas can be generated with fewer charges, one cake three inches diameter and one inch thick being equal to a plug one inch diameter and nine inches long, or about two *ordinary* plug charges.

I exhibited this apparatus at work before the members of the Manchester Photographic Society. The time from the lighting of the burner until the gas began to generate was one and three-quarter minutes, or about one-third of the time of another apparatus then and there tried.

To illustrate the safety of the apparatus at the above exhibition: as the gas was coming off rapidly the outlet was closed and the gas was still generating and escaping through the joint, as intended, with perfect safety.

FIG. 3. FIG. 4.



There are other methods of weighting the retort, as shown in the two drawings, *fig.* 3 (dead weight), and *fig.* 4 (lever and weight). In these cases the weight might be utilised for weighting the gas-holder, but I prefer the apparatus with springs and to weight the gas-holder with water, in a reservoir at the top of the gas-holder placed there for that purpose. W. I. Chadwick.

FURTHER NOTE ON ALKALINE DEVELOPMENT.

[A communication to the Photographic Society of Great Britain.]

In a communication to the *Philosophical Magazine*, and which was reprinted in last month's *Photographic Journal*, allusion was made to the reaction that took place in the developer when employing alkaline development; but not being at the time in a proper state for publication I did not think it advisable to give the entire details of the reaction.

Having been anxious to ascertain whether external oxygen had anything to do with the reduction of the bromide of silver, I thought it advisable to cause the alkaline developer to come in contact with the silver bromide in exhausted tubes, and then to note the result. I will briefly recapitulate the method of procedure.

Pyrogallic acid was carefully dried, a known portion dissolved in water, and made to cover some well-washed silver bromide of known weight. In the other tube was placed a solution of potash of known strength and perfectly free from all carbonic anhydride and from chloride. The tubes were then connected with a Sprengel pump, and after an aqueous vapour vacuum was formed the alkali was caused to run over into the tube containing the bromide and the pyrogallic acid. After allowing the liquids and solid to be in contact for a time—in some cases a fortnight—the tubes were broken, the liquid filtered off the residue, that latter examined for metallic silver, and the former carefully evaporated down to dryness in an atmosphere perfectly free from carbonic anhydride or other atmospheric impurity. It may be stated that in as many cases the liquid was made up to a known bulk, and a portion of it set aside for estimating quantitatively the amount of bromine present. It invariably was proved that, within the limits of error of manipulation, the bromine in the solution always agreed with the amount of silver bromide reduced to the metallic state.

In the paper above alluded to it is stated that the whole of the bromine combines with the alkali to form a bromide, and that, whilst the residue given by the brown solution when evaporated to dryness is totally insoluble in absolute alcohol, the alkaline bromide can be dissolved out. In nearly every case this plan of treating the residue was resorted to. By so doing all excess of alkali was removed, leaving behind only that part which might be in combination with the organic salt. At first I was inclined to think that the pyrogallic acid was absolutely decomposed into different compounds—amongst others, into carbonic anhydride—and that this was combined with the alkali.

I now find that such is not the case, for I find that acetic acid will not affect any change in the solution, no liberation of the carbonic anhydride taking place. If, however, nitric acid or sulphuric acid be added to it there is an immediate disengagement of the gas, and the brown colour of the liquid changes to a bright amber colour. It may be as well to state here that, if this solution be evaporated to dryness, we have a residue, part of which is soluble in alcohol, part in ether, and part insoluble in either. I have not thought it necessary to make an analysis of any of these, but the lesson learnt from it is that that compound, formed by developing, is readily split up into three others, together with carbonic anhydride. The next operation was the determining of the original organic residue. The combustion was undertaken in the usual manner. It was previously ascertained that each equivalent of pyrogallic acid displaced four atoms of bromine. The following is a statement of results obtained directly on breaking the bulk:—

$$C_6H_6O_3 + 4AgBr + 12KHO = 4Ag + 4KBr + K_8C_6H_4O_8 + 7H_2O.$$

This is a compound in which five equivalents of oxygen are taken up. On exposure to the air, or after passing a current of oxygen through it, the new compound absorbs another five equivalents of oxygen, and we have—

$$K_8C_6H_4O_8 + 5O = K_8C_6H_4O_{13}.$$

The first compound formed is much darker than the latter, and something of the same phenomenon may be observed in dropping an alkaline solution in a moderately old solution of plain pyrogallic acid, and the colour is first a deep brown, which, after mixing, the turbidity gives way to a more transparent and paler colour.

The examination was undertaken with solutions which answered to the strong alkaline developer. With weak solutions the reaction does not seem to be as complete; less silver is reduced proportionately to the amount of pyrogallic acid employed. As far as I can tell at present only one atom of hydrogen is displaced, and two equivalents of silver bromide reduced instead of four.

From the foregoing it will be seen that alkaline development of an image is independent of external oxygen, and I may say, further, that the less external oxygen admitted the more complete is the reduction. If the developer be exposed to the air before application, as it is also whilst in the plate, another compound is partially formed which is less capable of reducing the silver bromide—in fact, acts as a retarder to the original solution. It may be for this reason that it is a safe plan, in developing a plate, to flow the developer over it, and then return it to the cup and allow the detail to appear. If the strong alkaline developer be allowed to remain on the development is not so gentle, and there is a greater danger of veil. It must not be forgotten that the alkalinity of the pyrogallic acid solution tends to make it absorb oxygen from external sources very rapidly, and that there is always the formation of the two compounds.

W. De W. Abney, *Capt.* R.E.

THE SWING FRONT *VERSUS* THE SWING BACK.

[A communication to the Manchester Photographic Society.]

The recent appearance in the columns of The British Journal of Photography of two or three letters following an editorial article some weeks previously, on the subject of swing fronts and swing backs, seem to favour the supposition that the use of such appendages is, in certain quarters, somewhat imperfectly understood.

When Mr. M. Noton brought his ball-and-socket arrangement before a meeting of the Manchester Photographic Society two or three months ago I ventured to remark that, although the same ends could be equally attained by either swing back or front, or ball-and-socket lens tube, still I had found in practice that the swing back was a much more convenient arrangement—because, for reason No. 1, the axis of the lens thereby always preserves its parallelism with the base line of the camera; and, for reason No. 2, that a much greater latitude is necessary in the sliding up and down of the panel carrying the lens in the case of a swing front than is required when the swing is attached to the back. This is a sufficiently fatal objection when a Kinnear camera is used, because it will be found that the folds of the conical bellows-body will cut off a good deal of the margin of the picture when the lens is raised considerably over the centre.

The dispute about the looking-glass principle is simply a storm in a teapot; for it makes not one iota of difference whether the swing be constructed on the looking-glass principle or whether it be hinged at the bottom in the form of an inverted easel, and in accordance with a very neat arrangement adapted by Mr. J. Rogerson to the cameras made by him many years ago. The right inclination of the plate can be obtained just as easily in one case as in the other, and it is simply a question of economy in bulk or convenience in construction as to which of the two methods is chosen. In either case the focussing must be finally and carefully done after the swing is adjusted to the proper angle.

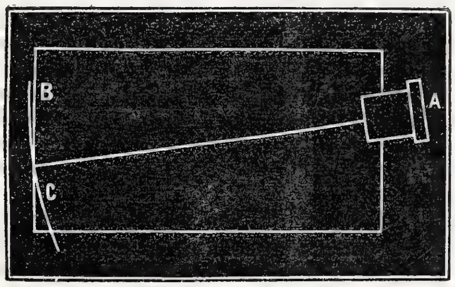
The real use of the swing is, however, a subject of much greater importance than the question of mechanical construction; and, as I consider too little has been said about the former and too much about the latter, I hope it will not be considered gratuitous on my part if I presume to give a short lesson on the subject deduced from my own experience, leaving those interested to use their own discretion as to form and arrangement of apparatus.

Let it be supposed that the subject to be photographed is the front elevation of a tall, narrow building—say ninety feet high—and that the exigencies of the case require the camera stand to be placed on the ground floor at a distance from the object only of 80 or 100 feet. Supposing the lens to be about three feet three inches from the ground, it is evident that an imaginary line drawn from the centre of the lens to the summit of the building will be considerably longer than another imaginary line from the centre of the lens to the base of the building; and, therefore, by reason of the focus of the lens being regulated inversely by the distance of the object from the lens, it will be found that the lower part of the focussing screen, on which is depicted the upper portion of the picture, will be required to be brought nearer to the lens than the upper part of the screen on which is depicted the base and foreground. The simplest way of meeting the difficulty is unquestionably by a swing-back arrangement to adjust the screen, so that all parts of the subject are brought into the best focus at one and the same time. This being done and the camera absolutely levelled, it will still be found that the parallelism of the perpendicular lines on the ground glass will not stand the test of a carefully-applied measuring rule. The reason is obvious. By means of the swing we have shortened the focus for the upper part of the object, and, in consequence, reduced the scale of the picture and the distance between perpendicular lines, as compared with the lower portion, so much nearer to the lens; so that, after all possible care with spirit level and swing, it will be seen that there is still a falling inward of perpendicular lines approaching the summit of the building, which, however, can be counteracted by a slightly downward tilt of the camera bodily. This slight movement should be sufficient to cause the upper lines to diverge to just the extent only to which their greater distance from the lens would make them converge, supposing the camera to be perfectly level.

To the photographer who is thoroughly initiated in all the difficulties of architectural work much that I have said will doubtless seem commonplace and self-evident enough; but I was somewhat surprised that one of the writers before referred to should recommend, as a means of preventing distortion in architectural views, "that the camera must first of all be placed perfectly level, the greatest care being taken that it be not tilted; next, the lens must be turned or tilted upwards, in the case of a swing front, in the direction of the upper part of the building, assuming it to be a lofty one," &c.

Now these instructions are so at variance with what the case demands, that I am inclined to think the writer in question has either penned them in a moment of forgetfulness or otherwise has not weighed the subject well over in his mind beforehand; for it is evident that the result of the turning of the lens upwards, by either a swing front or ball-and-socket lens tube, will be exactly tantamount to swinging the back forward—that is to say, it will bring that part of the focussing screen on which the longer pencils of the basement and foreground fall nearer to the lens, and that part of the screen receiving the shorter pencils of the upper portion will be thrown farther off, so that by this method it will be impossible to get either freedom from distortion or universal sharpness over the field of view.

CAMERA BODY.



A Lens turned upwards. B Basement and foreground. C Summit of building.

The accompanying sketch will show that, by turning up the lens, the image—say of the finial of a tall spire—will be formed considerably short of the focussing screen at the lower part, and the image of the foreground will only be sharply defined at a distance outside the screen on the upper portion. J. POLLITT.

NOTES FROM AMERICA.

JOKES IN AN AMERICAN CONTEMPORARY.—THE OLD *VERSUS* THE NEW WORLD.—COLLODIO-CHLORIDE.—TAKING LANDSCAPES BY THE WET COLLODION PROCESS.—HYPOSULPHITE OF SODA IN THE SILVER BATH.—HOW TO PREPARE AND SHOW PROOFS OF PORTRAITS TO CUSTOMERS.—MR. GUTEKUNST'S LARGE PICTURE OF THE CENTENNIAL GROUNDS.

WE have often expressed regret that nature has denied us the faculty of understanding and appreciating certain jokes which reach us from transatlantic sources. But although *we* are unable to do so, it may be that some of our readers may be more happily constituted; hence we give them the following "bit" from the editorial *Chit-Chat* of the St. Louis *Practical Photographer*:—"And din'nt I told you so? Off went his head into the waste basket of photography."

While pleading inability to understand the jokes of our young and wide-awake contemporary, this cannot be said regarding the more serious and practical matter found therein. To give our readers an idea of the estimate formed by a clever American photographer and editor of the position occupied by his own countrymen in contradistinction to photographers in Europe we quote the following:—

> There is no mistake but what the photographers of the old country take more interest in the elevation and progression of photography than in this. Look at the hundreds, and we might say thousands, who are experimenters in the art of photography among some of the best sons of Old England, and there it is considered an honour and credit to work and follow in the art of photography. How many have we of such in this country, who follow it for the love of it? Scarcely one. It is difficult to tell why this is; but it is true, nevertheless, and will be so till photographers take a higher stand in photography and art-matters, and not cater altogether to the interests of their own pockets, instead of their taste and judgment of what is right or wrong in photography.

A correspondent of the journal just named gives a formula for the preparation of collodio-chloride as follows:—

No. 1.

Alcohol	2 ounces.
Ether	3 ,,
Pyroxyline	60 grains.

The above is to be dissolved. Then 120 grains of nitrate of silver, powdered finely, must be dissolved in three ounces of hot alcohol after which it is poured into the collodion, stirring all the time.

No. 2.

Alcohol	4 ounces.
Ether	4 ,,
Chloride of strontium	32 grains.
Citric acid	24 ,,
Pyroxyline	60 ,,

Reduce the strontium and citric acid to powder and dissolve in the alcohol; then add the ether and pyroxyline. When required for use Nos. 1 and 2 are to be mixed in equal parts.

In an article by the editor showing how he takes views in the country, he says:—

> There is a great deal in system and order, and having everything ready—a place for everything, and everything in its place—as it saves time, and often patience. So before we take our first view we will show you how we do it and get ready so quick, without hurrying either. First, we have our silver solution filtered in a vulcanised rubber bath (that has been coated with paraffine), which we fasten to the bottom of our tent, inside. We unscrew the top from the bath, coat our plate, dip it into the bath gently; after being well set we cover over the top of the bath with a piece of black velvet. While the plate is coating we get everything else ready. We have a stock bottle of developer already mixed, and a four-ounce bottle to develope from, which we half fill with developer, for a 5 × 8 plate, and put it in the tent, ready to develope with. We have a two-ounce bottle, and into that we pour our glycerine solution; we also carry a stock bottle of that along. It is made thus:—Take two ounces of glycerine, four ounces of acetic acid, and ten ounces of water; shake well, so as to mix, and it is ready for use. These quantities in the small bottles are sufficient to develope a 5 × 8 plate, and have a little left over in your bottles. To prevent mistakes in the dark tent in handling always keep the developer in the large bottle and the glycerine solution in the small one. We carry no water with us, and do not use any for viewing while away from our gallery, even if we are absent a week. All you have got to do, after you develope your picture in the dark tent to the right point for washing, is to pour on the glycerine solution out of the two-ounce bottle, and that immediately stops the action of the developer and preserves the picture until you wish to clear it up. You can even expose it, outside the tent, to the light for a short time without injury to the negative; so this dread of the want of water is done away with. We have not used it for years in viewing excursions. We have a tin tray in our tent to catch the waste solutions. Put the tray in your tent, so as to have it ready for developing in. Dust out your plate-holder, and open it, ready for your sensitive plate. Put your collodion bottles in your tent, also your duster absorbers for the back of your plates; keep your glass in separate paper bags, with a small piece of sticking-paper on one corner of the side that is not albumenised, so as to prevent any mistakes in coating the plate.

In addition to what Mr. Fitzgibbon says, we have merely to remark that a wooden bath, coated with a mixture of paraffine and wax, answers well for use in the manner described. It is cheap, light, does not injure the silver solution, and is not liable to get out of order.

Innumerable are the evils attributed to the accidental admission of hyposulphite of soda into the nitrate of silver bath. It has remained for Mr. D. G. Munger to show that such an accident as that just indicated ought to be considered as a great blessing. This gentleman had not believed it to be necessary to clean his scales after weighing hyposulphite of soda, previous to using them to determine the weight of some nitrate of silver with which he was about to prepare a new negative bath. Consequently a lump of soda got into his silver bath, which, when the discovery was made, was placed on one side in order to be reduced. Some months afterwards, however, he, previous to precipitating the metal, tried the effect of coating and exposing a plate prepared by the agency of this solution. He says:—

> Judge of my surprise when, upon developing, not a hopeless fog, as I had expected, but an unusually clear chemical effect was presented. I

went directly and picked out a piece of soda, as near the size of the piece I had accidently used as I could remember, and made a memorandum of the weight. This was the best and longest-working bath that I had used for a long time. Still, I had no confidence in hyposulphite of soda as a good thing to put into a negative bath, and did not try it again for a year or more; but, when I did, it was with the same results. Again I dropped it, and again I have just made another hyponitrate bath, and find it the same as before. I have never made a bath in this way that has not worked directly and unusually clear. The formula is—nitrate of silver, five ounces; hyposulphite of soda, five grains; water, sixty ounces. Dissolve the silver and water together; iodise, and try without adding acid. If acid is needed add one drop, chemically pure, at a time. More soda might be better; let some one try.

It would seem that the showing of proofs to sitters has developed into a kind of nuisance among American photographers. One lady is reported to have sat ten times in a certain gallery, and, after all, to have gone to another photographer, as she was dissatisfied with the results hitherto obtained. Mr. Frank L. Stuber, however, finds that the showing of proofs is an excellent thing if one set about it in a proper manner. After studying the matter over some time and experimenting he hit upon the following plan by which to get rid of so many sittings. He observes:—

I have succeeded very well—at least it works splendidly in my gallery. I make my negatives same as usual, 4¼ × 6½ plates (for card photographs) that size. I am only working at present in this way. When the negative is developed and fixed set it on a piece of blotting-paper for a few moments to drain, at the same time have a sensitised quarter-plate in a small dish or bath-holder. Now lay the negative on a table, put two strips of thin cardboard on each side and lay the sensitised plate on the top, film facing; next, I have a small window in my dark room, in which place a coon, which projects outside. At the outer end have a small hole or diaphragm, about one-fourth or one-half inch opening, covered with mineral, tissue paper, or ground glass. On the inside I have fastened a plate-holder, in which place the two plates, which are held there with a spring. I now pull the slide and expose through the negative for a short time, then develope and wash. I now have a transparency which is far superior to a paper proof as a general thing. Do not fix the transparency, as they show to better advantage and the work is done quicker. Now take it out and lay it on a retouching-frame and cover it with an oval or any other shaped mat, then invite the sitter to examine it. I now have the advantage of listening to the criticism, and can correct them wherever I see that I can improve the negative by retouching or printing. The great advantage is that the operator will be more careful in making his sittings, so that he will not have to make a resitting. When the transparency is satisfactory the negative can be varnished and immediately handed to the retoucher, thereby saving a great deal of time, and the work will be finished so much sooner. At first sight you might think that the sensitising will cost more than to make a paper proof, but I say not. Now, if you make a paper proof your negative has to be varnished, the proof printed, turned, &c. The customer takes the proof home and it is compared with a finished photograph, criticised by those who do not understand anything about the work, or how it will look when finished. They will say—"You had better try again, and then we will take our choice." And nine times out of ten they will take from the first proof. If the sitter is to be retaken the operator will very often have to work according to the customer's ideas, thereby making many failures, for every operator should understand best how to produce his work satisfactorily. Further experiments show that the positive will be much cleaner if the negative is not drained, but exposed immediately after it is washed.

We have already alluded to the large picture of the Centennial Grounds taken by Mr. Gutekunst, of Philadelphia. We have received from that gentleman a letter, in which he says:—"On page 144 of the Journal of the 23rd March I find an article by 'E. L.' (Jersey), in which the writer claims to have ten photographs on one piece of paper ten feet long by twenty-four inches high, and that they were done in 1870. I take the liberty of sending to you a section of my large print of the International Exhibition of 1876. This section is printed from three negatives, and represents about one-third of the entire photograph." The picture received measures about forty-three inches by sixteen inches, and the junctions are admirably effected. Mr. Gutekunst adds that he was not aware that "E. L." or any other person had ever printed a photograph from one or more negatives on a single piece of paper ten feet long, and he considers it strange that such a print, or (as "E. L." says) ten of them, should have been kept so long from the knowledge of the world. "I should like," adds Mr. Gutekunst, "to have my print put in critical comparison with those of 'E. L.' or any other panoramic photographs, and I hope that 'E. L.' will not object to placing one of his ten specimens in comparison." The gauntlet is thus fairly thrown down to our Jersey correspondent, and it remains to be seen if he will take it up.

ANOTHER IMPROVEMENT IN MAKING OXYGEN.

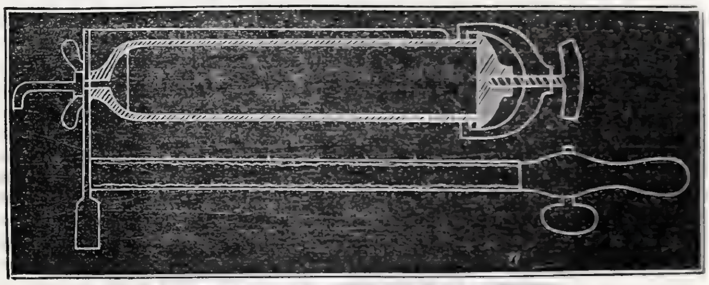
[A communication to the Manchester Photographic Society.]

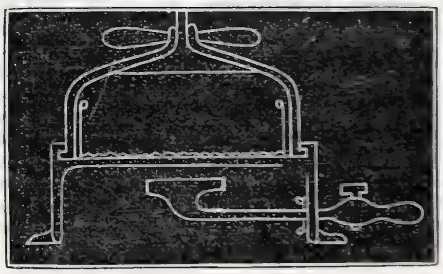
At our last meeting Mr. M. Noton gave us to understand that chlorate of potash and black oxide of manganese could not be used conveniently with the portable apparatus until it had passed through the process of being kneaded into cakes or plugs and then baked. This, I believe, is quite true of every portable oxygen generator, with the exception of the one before you; and, as I was the first to show that only one generator was required to be used with the portable oxygen apparatus if it was of the proper construction, I think I am also the first to point out that the oxygen mixture can be used with the portable apparatus without its having to pass through the kneading process.

I will now show you my method of making oxygen without having to pass through that dirtiest of dirty jobs, making the oxygen mixture into cakes or plugs; and I would take this opportunity to direct your attention to the very great simplicity of the whole. You may keep the oxygen mixture in a bottle or anything you wish, and you have simply to pour some into the case and put the case into the generator. When it is exhausted you will see how easy it is to withdraw, or perhaps make it withdraw itself.

A few of the advantages I claim for my patent apparatus are as follow:—First: the great simplicity and portability of the apparatus. The one before you will generate eight or ten cubic feet of oxygen per hour, and can be carried in the pocket. This, I think, you will admit is a great improvement. Second: greater safety, as the oxygen mixture is placed in an inner case, and therefore cannot fly off in pieces and stop the outlet. Third: the inside of this generator is kept cleaner than any other, because the oxygen mixture is not in contact with it. Fourth: you may avoid the mess of making the oxygen mixture into cakes or plugs and having to bake them, and afterwards carry them as carefully as if they were eggs for fear of breaking them. Fifth: you have the exhausted charges in a cleaner and more compact form than by any other plan.

The generator, by altering the shape of the cap, can be used vertically like the old-fashioned retort, in which case to get it to decompose an equal amount of oxygen mixture it would require to be made shorter and larger in diameter. This, of course, increases the circumference of the joint, which is a serious objection; or it may be used diagonally or horizontally, as you see it. Both these positions, I think, were first introduced by Mr. Noton, and either is better than the vertical position for other reasons besides the one stated. For the benefit of the members not present I have made a sketch of the generator in the horizontal as well as in the vertical position, which will, I think, enable them to understand the whole.





David Young.

◆

ON THINGS IN GENERAL.

I have heard many discussions upon the connection between the fine arts and photography, and on occasions have not been afraid to take part in them myself; but I never before heard a disciple of the brush and palette termed a "pigmented artist." I hereby present my thanks to Mr. Wormald for his happy *jeu de mot*. I am curious to know whether the picture referred to in the county court case recently referred to in these columns owed any of its attractions to a pigmented artist, or whether it was photography pure and unalloyed. "An excellently-executed and elegantly-framed portrait," I read, was exhibited in a public-house, with an accompanying intimation that an equally beautiful picture and a dozen *cartes* could be had by joining a certain club and paying a guinea. A confiding aspirant for pictorial publicity paid his sundry coppers and silver till their sum total amounted to a guinea, and then went and was "done" by the photographer. He considered himself doubly done, and the judge of the court thought so too, and ordered the return of the guinea from the too enterprising photographer and the payment of all the costs of the case in addition. A good-sized, framed picture and a dozen *cartes* all for a guinea! They must have been execrable or the judge could not have given the verdict he did. Photography is represented to be flourishing, but rather than "go in" for it in this fashion I would "break stones" or "grind an organ."

Perhaps, after all, the judge expected too much for the twenty-one shillings. It is in the experience of every photographer how very expectant the outside public are with regard to the photographer's work and to the artist's time, too few making allowance for the skill obtained by long practice and the time required for proper cultivation of the artistic faculty—a relic this of the early days of the art when its ranks were recruited from broken-down shopkeepers, shoeblacks, whitewashers, and the like. Surely some such memories actuated the advertisers who last week published their wants as follows:—

> "*Boy Photographer.*—Two gentlemen (amateurs) will give a comfortable home and liberal wages to a boy not over sixteen years of age, of good manners and appearance, and competent to instruct them in the rudiments of photography, silver printing, and the management of the nitrate bath. Engagement to last three months certain."

Three months by a boy of sixteen to coach a couple of gentlemen in the rudiments of the art!

This advertisement is only one degree less remarkable than another that follows, which I cull from the same page. I have vainly endeavoured to comprehend its meaning; but perhaps some of the readers of this Journal can help me, for it seems to hold out a very enviable position in some lights, such as would just suit me if I were to cast aside my armour.

> "*An Opportunity for a Pushing Man, with Something New to Talk About.*—Wanted, for the country, a steady trustworthy man, to, as it were, start in business without money or plant. Ability must make up for that. Established over 25 years. Glad to treat either for share or commission in any way practicable for a permanency."

The former advertisement was the means of calling to my mind a striking contrast when I read an account of Mr. Brassey's yacht—how beautifully it was fitted up for photography, and how splendid the chances its owner's fair wife would have of reaping a rich harvest in photography. I remembered the case of a friend who had a beautiful yacht—a noted prize winner and the hero of a wonderful sailing feat. He purchased a thoroughly complete and first-class set of photographic apparatus, with stores of chemicals and dry plates. He did not engage a boy to teach him. He went to a leading photographer, and paid him many guineas for tuition. At last, feeling himself *au fait*, he carefully packed up everything in a case purposely made, and, putting the key in his pocket, had the whole conveyed safely on board his yacht, and soon weighed anchor for a three months' cruise in the Mediterranean, intending to bring home many pleasant *souvenirs* of his sail. I saw him directly after his return; he had never once taken the key out of his pocket, and he returned home with his maiden apparatus, and sold it at once for a third of what it cost him! That this is a true tale I can vouch.

Now, what a contrast to this gentleman is offered by that most successful and enthusiastic photographer, Mr. York. His work is too well known to need praise from me, but I must say he stands much higher in my regard after reading his paper than he did before. The man who can keep his temper and take a good street view and like the work is a very paragon of perfection. Of all photographic work possible I should hate that. Standing in the middle of the gutter, a mark for all the gibes and jeers of every passer by, quaking lest one's plates get spoiled waiting for a good chance, beguiling a lot of dirty-faced ragamuffins to keep them out of the field of view (*I* should be inclined to use a revolver), what could be more gallingly annoying? And sometimes to have two cameras going at once! The man must be more than human who likes this class of work.

This month—may I not say this year?—will be rendered memorable by two great discussions—the nitrate bath and the famous five resolutions of Mr. Gladstone—either of which promises as satisfactory an ending as the other. If the great bath question had left off the day it began it might have been well thought of; but now it has gone from the region of facts and experiments into that of fancies and opinions. Nevertheless it is a large question not finished with yet; but it is one to be solved only by heavy practitioners—the men who use up a gallon of bath in a short time, and to whom a quart or two of collodion is as nothing. The photographer who takes a few dozen negatives a month is not the man who can say much about it, for baths tend to rectify themselves from pinholes by keeping, and slight use is almost the same thing. We want still more facts—still more experiments.

The mountain is still in labour, but, according to the accounts of the ew experts, it is to be a giant and no mouse that we shall soon see. M. Boissannas' process is not yet offered here; but on the continent a few have bought it, and speak most highly about its very great powers in lessening the exposure, but they are under a promise not to divulge the secret under any consideration whatever.

I sincerely hope and trust it may turn out to be a good thing, and not like M. Duchesnes' clock, which, presented to the Photographic Society of France, was to do some wonderful things in the way of beating time and striking, &c. On the occasion of its presentation it declined to perform, and though taken in hand by a celebrated constructor who was present it shamefully refused to do anything at all!

There are no new processes this month to chronicle, strange to say; but there are some very remarkable discoveries. Thus, M. Boivin, of Paris, has accidentally discovered that pyroxyline is inflammable. Placing a film too near his lamp it exploded, much to his astonishment. He then took some dried bits of emulsion films and, wonderful to relate, they also exploded! It is satisfactory to learn that he proposes still further to investigate the matter so as to arrive at the rights of this singular phenomena. Perhaps at the same time he might ascertain whether the vapour of ether would explode when mixed with air; whether alcohol is inflammable, and whether or no gunpowder is an unsuitable fuel for a laboratory fire!

Though there is no new process there is an avowed resuscitation of an old one. On page 200 of this Journal there is found a cutting from an old newspaper sent by "A Neapolitan Photographer," who, though he has not tried it, gives it fresh publicity. It consists, as far as one can judge, of applying to a sensitised plate a mixture of some of the most extraordinary ingredients it is possible to conceive—honey, lampblack, creosote, and white of egg well boiled together. These form only a portion of the simple and innocent mixtures to be poured on to the recently-sensitised plate! "A Neapolitan Photographer" very naïvely says he has not tried this, as he prefers emulsion processes.

The Autotype Company are undergoing another license phase. They now offer a license, for the cost of the stamp, to those professional photographers who have been systematically working at carbon for some time past. Apart from any question of legality of patents, this is a very graceful way of acknowledging the work done by others, and cannot fail to improve their position. I must say that, in all my dealings with them, I have found them thoroughly honourable, straightforward, and obliging.

Free Lance.

MY STUDIO.

Operator No. II.

Like Robinson Crusoe, here I stood monarch of all I surveyed—a surveyor without a plan. "I shall have to advertise," I thought; but then the difficulty was to know the right man when he came.

It would have been of an easier nature if the qualifications of a good operator could be ascertained from the face of the applicant, but the qualities of a good operator are not to be so judged, as the most unlikely men sometimes produce the best results; and, as stained fingers are very much alike in all wearers, one cannot judge much by appearances in that direction.

Again I applied to a friend for advice. He advised me to advertise; also to get a portrait of the applicant and samples of his work. "One thing be sure of," he said; "see that the samples sent are really the work of the sender, because I have known cases in which the representative work forwarded was not the work of the sender at all. It certainly had been produced in the studio from whence he came, but he (the applicant) had nothing to do with its production further than the appropriating of the same for the purpose of showing as his own work." So I went about the matter very cautiously; but my second man was not a success. The man I engaged had been a photographer for years, so he did not lack experience. For a year or two he had been employed going about the country taking groups of school children—a trade that seemed to have paid him very well; but he had got tired of it, and wished to settle down. He took a very good negative, and would have got on very well but for two faults, which became quite prominent before he was a week with me. The first of these was an awkward habit of keeping his hands in his trousers pockets, and never taking them out if he could help it; the second was that whenever he had the chance he was smoking common twist out of a short clay pipe. These two things were scarcely consistent with his artistic profession. Without saying anything I tried to look and smell the thing down; but he did not see it. I was getting quite tired of it. When going to the studio one forenoon I found my manager standing at the foot of the stairs engaged in both of his failings to the top of his bent. The pipe disappeared at once, and a smile replaced it as he turned and walked upstairs. On entering the studio I was not in the best of tempers.

I remarked—"It is scarcely good enough, Mr. Walls, standing down there smoking, and your place in this mess."

"Well, you go sniffing about the place if I take a smoke here," he said with a sneer.

"You are impertinent, sir," I replied. "I did not engage you to smoke but to work. Smoke at home."

"Oh! never you fear," he said; "if anybody comes to be taken I'll take them."

"Yes; but at the same time you will acknowledge that there is a right and a wrong way of doing things. You have no sitter; but are you, or were you when I saw you down there, in a position to take a sitter? Certainly not; your place is not ready, and your face just now does not look willing."

"If I am to be interfered with in this way I don't care for your place," he said, turning on his heel. "And you think that you can teach me the right and the wrong way to take a picture!" he said, with a laugh.

"No," I replied, "I make no pretension to do so; but I'll tell you what, I can give you some idea how your place ought to be kept, and also I can inform you that it is not part of your duty to stand in the street smoking when you should be here."

"There's no work to do here just now."

"What of those four copies in the books to be done?"

"There's no light to do them." (Now I know this was not true—but then I was ignorant.)

"Well, what about the place being in this mess? See, here is your camera; there are your slides. Look at that dirty glass—at these old prints! Can nothing be done to keep the place in better order?"

"Yes; send up the girl to clean it. I'm not going to be made a charwoman of."

"The same old game," I replied—"as little as ever you can do for your money; but for your own comfort I should think you would try to keep your own province in something like order, especially when the girls are busy printing down stairs, and you have absolutely nothing to do."

"Look here!" said Mr. Walls, with a sneer on his face—"if I'm to be master here you had better leave the matter to me, and I will give you negatives; that's what I'm engaged for. If that don't suit you, hand me over my money and we'll cry quits."

"As you are only manager and not master here," I replied, "you must bear to be spoken to without being uncivil."

"Oh! you're a deal too particular for me. Give me my money and let me go. And it strikes me you had better shut up the place, unless you can get an angel to work it, for no man will put up with your nonsense!"

"There's your money," I said, handing over what was due to him. "You should stick to outdoor work; its the thing for you. There you can smoke common twist as much as you like, and the wind will blow the smell away."

As he went away I began to fancy that I must either be very fastidious or operators must be very eccentric, and mentally asked—"What am I to do now?" MURRAY RUSSELL.

UPON WEAKENING, INTENSIFYING, AND TONING CARBON PICTURES.*

VI.—DIFFERENT TONINGS OF THE CARBON PICTURE.

33. BARYTA or lime water and alizarine dissolved in alcohol colour violet.

34. Plumbic acetate and alizarine in ammonia colour a red purple.

35. The solutions of alizarine in caustic alkalies give a series of tints varying from violet to purple according to the proportion of water they contain.

36. Aniline red in alcohol, though excellent when used as an intensifier in the enlargement process, is not usable for toning.

37. Sulphate of zinc and an alcoholic solution of coralline red with an ammoniacal addition colours rose red.

38. An ammoniacal solution of coralline diluted with water colours carmine red.

39. An ordinary coralline solution in alcohol colours red.

40. Turmeric tincture toning would be unstable.

41. A solution of extract of indigo colours blue. Of its compounds it may be remarked in this place that:—

42. A solution of extract of indigo and bichromate salts furnishes a very agreeable greenish tone, which would be suited for toning landscape transparencies.

43. Plumbic acetate and purpurine in ammonia colour purplish-red.

44. Purpurine dissolved in a hot solution of alum colours cherry-red.

45. Purpurine dissolved in caustic alkalies colours carmine-red.

All the above-mentioned alkaline solutions, as has already been remarked, should only be used when largely diluted with water. Detailed particulars of the methods of lightening the over-intensified pictures are not given in this paper, since one can observe the progress of the colouration, and can at any time check or diminish the colouration as it appears by washing.

As it is impossible to indicate by mere words the exact difference of tone in all these intensifications from Nos. 1 to 45, I shall place before the Society, along with this paper, a specimen carbon print illustrative of each method, and shall willingly give any further information that may be desired by the favourable reader.

In order to intensify a carbon print equally care must be taken that every part of the plate to be intensified is equally dry. Therefore the carbon picture should be intensified either immediately after it is fully developed or not until it has become perfectly dry. The only partially-dry picture will be spotty or unequally intensified, in consequence of the unequal saturation of the gelatine film with the intensifying solutions.

The intensification is done, as is known, either with a single solution or by successive treatment of the plate with two or more. The carbon picture is coated with the developer in the usual way, and if it were dry it is previously rinsed with water, so that the whole picture film may be brought at the same moment under the influence of the intensifier. When several solutions are used for the intensification the surface of the picture must be well washed after each, or else the various solutions, by combining chemically, would form upon the picture a fine coloured precipitate, which, adhering to the gelatine of the upper surface of the picture, might occasion unequal intensification.

When large plates, or plates requiring special care, are to be intensified it is most convenient to lay them, picture side uppermost, in a vessel containing the intensifying bath, as this allows of the progress of the intensification being more easily watched, which is desirable, because too long intensification often hardens the negative, and, like the permanganate of potassium, sometimes destroys the details. Usually the intensification process lasts from five to ten minutes. If the picture do not appear to be completely intensified the process must be repeated until the proper degree is attained, even if the picture have meanwhile become dry.

As a rule, intensified pictures do not require to be steeped in alum, because many intensifiers act upon the picture film like alum, while others, on chemical grounds, do not permit its use. At the conclusion of the intensification the picture must be properly washed with pure water in order to remove from the surface of the picture any loose deposit or any remains of the dissolved reagents.

Carbon prints which are intended to serve as negatives for production of enlargements should neither be waxed nor coated with collodion nor gelatine, because any inequality in the wax, collodion, or gelatine coating would, of course, appear enlarged in the enlarged picture. In intensifying, with a few exceptions already mentioned, the collodion and gelatine films are intensified together, thus causing foggy and flat pictures, poor in contrast and not plastic.

For those carbon negatives whose intensification is here kept in view one requires, therefore, an ordinary negative tablet. [A piece of plate glass such as is used for ordinary negatives?] Good tissue adheres well to an unprepared glass in consequence of the adhesive power of the gelatine, which fastens to all firm substances, and also in consequence of the absence of air between the picture film and the transfer.

In his book, *Der Kohledruck*, Herr Liesegang remarks that carbon prints which are developed upon plain or collodionised glass plates are liable to be injured by the picture film becoming reticulated, and therefore he recommends that the glass plates be prepared with a previous coating of a weak solution of alum and gelatine.

With that opinion of the esteemed author I cannot altogether agree; good carbon tissue should not, and does not, produce reticulated pictures, even although the transferring glass should be unprepared or collodionised. With me the picture film has never become reticulated with unprepared or collodionised plates without the action of strong alkaline or acid solutions. I am, however, well aware that even those pictures which have been developed upon gelatinised glass plates become reticulated, because a number of soluble particles of gelatine from the prepared plate are floated out during the developing process and confer a reticulated appearance on the picture. It may happen that the reticulation of the picture film may be caused by air-bubbles which are formed in the picture film or between the picture film and the support. In this case the cause should be sought—not in the way of preparing the support, but in the substance which prevents the immediate contact of the picture film with the support.

The first cause of air-bubbles in the picture film, or between that and the support, is the inexperience or carelessness of the operator. When the exposed tissue is not laid flat upon the glass support one large air-bubble may be overlooked, and an application of the squeegee will divide it into innumerable small bubbles, which enlarge with the higher temperature during the development and weaken the adhesion of the picture to the glass. The idea, therefore, that air-bubbles are removed by a squeegee, or by putting a weight upon the plate, is perfectly erroneous from the practical as well as the theoretical point of view, so that one should try to prevent their formation at all by placing the tissue upon the glass under water. The formation of air-bubbles is also promoted by the habit of putting tissue upon the glass support which has already soaked in cold water until it has become perfectly saturated with water, and the tissue has began to curl at the edges with the picture film outwards.

The water-bubbles, which sometimes appear in consequence of the developed picture having been left too long lying in water, are different from these. Those are simply removed by drying, but the case is more difficult when the blisters are formed by enclosed air. This evil is universally complained of when very soluble tissue is used, as sometimes the air-bubbles cannot be removed from the picture by mechanical means. A happy idea was suggested to me on this subject by my friend, Herr Theodor Szretter, in common with whom I worked out these and former experiments. Water absorbs a certain quantity of air, of which it is deprived by boiling—a loss which it tries to repair by seizing again upon air wherever presented to it. Place, then, the blistery tissue picture film undermost in water which has been boiled and then cooled, when the water will draw the air towards it, while the attraction of the gelatine towards the hard substance of the support effects by physical means the flattening of the picture upon the glass.

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* Concluded from page 224.

Should the picture film tear in the course of developing, and not adhere to the glass, the cause is either the too great solubility of the tissue, the chromate bath, the temperature of the water, or that the collodion had been allowed to dry upon the plate previously rubbed with stone alum, before it was placed in water to remove the grease. I shall give no further details as to the development here, because they are already sufficiently well known.

The carbon print developed upon plain, unprepared glass may be warmed and varnished as a negative, or it may be coated and protected with an opal-coloured gelatine solution if it be a transparency.

Karl von Stefanowski.

PHOTOGRAPHY IN COLOURS.*

7. Printing and Superposition of the Monochromes.—In the present state of photography there are numerous ways of producing positive proofs, either red, yellow, or blue, endowed with transparency. We have only to utilise the methods in question to form, by the intervention of my three heliochromic *clichés*, the three monochromes constituting one heliochrome, and to superpose these three monochromes.

Amongst these methods I have already mentioned the gelatine with bichromate, with perchloride of iron, &c., photoglyptic impressions in fatty inks, printing used for vitrification, or photographic enamels, &c.

I should evidently exceed the reasonable limits of this paper if I gave in detail each of these methods in their application to heliochromy, the more so that they subdivide into a great number of particular processes, for the great part well known under the names of their inventors. I will limit myself, then, to show as an example how the bichromated gelatine or carbon process may be applied to heliochromy.

Swan, Leon Vidal, &c., put in practice these kind of impressions by means easy enough, it appears, to procure prints for the superposition of the three monochromes. I will describe the equivalent series of operations by which I arrive to get at the same result.

I obtain my three monochromes by making use of three sorts of paper—one coloured with carmine, one with Prussian blue, and one with chrome yellow. Manufacturers will furnish operators the three sorts of paper ready made.

The amateur who wishes to make them himself should proceed thus:—

(1.) *Prepared Paper, Carmine.*—Dissolve five grammes of carmine in 500 grammes of liquid ammonia; spread it out in a basin. Leave the ammonia to evaporate in the open air till its odour has nearly entirely disappeared, this requiring a certain number of hours. Add then rain water in sufficient quantity to compensate for evaporation of the ammonia, and to double the quantity originally, which will raise it to one litre. Soak therein cold for about an hour about 150 grammes of gelatine very soluble (gelatine grenetine, for example). Dissolve it in a water bath moderately heated, 50 to 60°. Filter it through a flannel wetted firstly, or in a funnel fitted with a very fine wet sponge; retain the mixture in a basin kept tepid. Throw into a graduated glass the quantity of this liquid which will be necessary to cover the sheet of paper to be prepared—say twenty-five centimetres cube for the dimensions, eighteen centimetres by twenty-four; and, lastly, empty the contents of the glass on the said sheet of paper previously applied on a glass plate.

The application is made thus:—The plate is kept at a sufficient temperature by means of rain water heated by a warmer and contained in a deep tin dish. In this dish the glass is submerged, and above the glass the sheet of paper. A border having been previously turned up all round it the paper and the glass are lifted out, so that the paper lies down close on the glass. The excess of water existing between the paper and the glass is squeezed out by means of a strip of india-rubber; the coloured mixture is thrown on to it, the plate held in the hands is slightly rocked, and the layer is regulated by a glass triangle. It is allowed to cool horizontally on a level plane. When the gelatine is set there only remains to detach the paper from the glass and to leave it to dry, suspended by means of pins from the two extremities of the same side, aided by a stove where the temperature would be too low; that is to say, below 18 or 20° C. (the temperature of the stove ought not to exceed 25°). If bubbles are produced on the paper when the mixture is poured on we must conclude that the water in the bath is not hot enough for the mixture; the bubbles cease directly the glass and paper are raised to a higher temperature. The paper for this mixture, or for the two other kinds to be hereafter mentioned, should be resistant, fine grained, and not too much sized.

(2.) *Paper with Prussian Blue.*—A supply of blue fixed ink must be provided, such as is to be found at stationers'. In a litre of liquid, formed with rain water and from 100 to 150 centimetres cube of that ink (as it is more or less deep coloured), soak cold during about an hour 150 grammes of the gelatine above mentioned; then dissolve in the water bath, filter, and proceed exactly as beforesaid for the red paper.

(3.) *Paper Mixed with Chrome Yellow.*—Soak in a little water (fifteen to twenty centimetres cube about), during twenty-four hours, twenty-five grammes (light chrome yellow, water colour). After having broken it, at the end of that time make a paste of it in a mortar, adding water little by little to make up a litre, and soak cold for an hour about 150 grammes of the same gelatine; dissolve it in the water bath, &c., &c.

The papers on which are spread the one or the other of these three mixtures should be of the same pulp and the same weight—in a word, of the same manufacture—so that the baths and the dryings which they undergo to form the three monochromes of the same subject shall not produce appreciable inequalities in their respective dimensions. Up to this time I have sensitised these three papers in a very concentrated bath of the double bichromate of potash and ammonia. I concentrate it more if the *clichés* are less soft, or if the gelatine of the prepared paper be more charged with colour. This increased charge of bichromate is not only to increase the sensibility of the paper, but also to furnish images but slightly intensified. One will understand that the polychromatic image in question to be obtained is formed by three superposed proofs; each of them should be much less vigorous than would suffice for the single proof in itself.

(To be continued.)

Meetings of Societies.

MANCHESTER PHOTOGRAPHIC SOCIETY.

The last meeting before the vacation was held at the Memorial Hall, on Thursday evening, the 10th instant,—Mr. Alfred Brothers, F.R.A.S., President, in the chair.

After the routine business had been disposed of, Mr. Pollitt read a paper on *The Swing Front* versus *The Swing Back.* [See page 233.]

Mr. Coventry exhibited a swing-front made by himself to illustrate a principle suggested by Mr. Woodbury.

Mr. D. Young read a short paper on *Another Improvement in Making Oxygen* [see page 235], and exhibited the retort in action.

Mr. Noton said the specific gravity of oxygen plugs was greater than that of the same mixture in powder, and, bulk against bulk, yielded more gas.

Mr. W. I. Chadwick showed his oxygen machine improved so as to be absolutely safe, and made some gas to exhibit the action of the spring arrangement in his retort.

The President exhibited an instance of a negative having been changed into a positive by the action of light before fixing; also a daguerreotype plate iodised about twenty years since, which he accidentally found was still sensitive.

Mr. J. B. Robinson sent a sample of waterproof paper suitable for making developing trays; also a tray of the same material which had been full of water half the day.

Mr. Chapman exhibited a specimen of glass wool which, he said, was useful for filtering purposes.

Mr. Coote showed some good examples of clouds printed on ferroprussiate paper, which he used as a sort of index for his cloud negatives.

Mr. Pollitt exhibited some of his splendid interiors of the new Town Hall, taken on wet plates with a swing-back camera. Some of the negatives were exposed five hours.

Mr. Chadwick presented the Society with a pair of legs and a new box for the sciopticon, and was awarded a vote of thanks. A similar compliment was paid to the other gentlemen who had contributed to the interest of the proceedings, and the meeting was adjourned.

EDINBURGH PHOTOGRAPHIC SOCIETY.

The second outdoor meeting of the season was held on Thursday, the 10th inst., the scene of operation being Bothwell Castle.

Assembling at the west-end station at 8-30 a.m. the members took the train to Hamilton, where conveyances were waiting, in which the drive to Bothwell was accomplished. For some days previously the weather had been dull and disagreeable, but the party were hopeful that a slight breaking up of the clouds indicated an improved state of matters as probable. In this they were not disappointed, as by the time the Castle was reached the Sun had appeared with all his cheering influence on the would-be landscape photographers. The day, however, was not by any means favourable for photography, as during its whole course the wind blew a pretty stiff gale, the result of which was not only the limiting of the subjects to such as were least affected by it, but in more than one case the overturning and serious injury of the cameras.

Bothwell Castle stands on a beautiful green bank high above the Clyde, and is considered one of the most magnificent ruins of its kind in the country. It measures some 234 feet along the summit of the bank, terminating at each end in a lofty, massive tower having walls upwards of fifteen feet in thickness. The date of its foundation is lost in the obscurity of the past, but it existed as a great baronial stronghold in the days of Wallace and Bruce, and was for some time inhabited by Edward III. of England.

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* Continued from page 213.

Members attending such outdoor meetings, especially those who work large plates, know how desirable it is that the party should include a few friends without cameras, ready to lend a hand in carrying the apparatus from place to place. That it is not always well to trust to such aid, however, was made manifest by an incident which occurred at an early period of the day, and rather damped the spirits of the party for a time—at least of one of the party. As the members assembled at the Caledonian Station the "traps" were disposed of in various compartments—there not being a carriage in the train large enough to hold all present—and when the necessary change was made at Holytown each seized on as much as he could carry, altogether irrespective of ownership. Trusting to the united action to have transferred everything to the train on the Hamilton branch, they "went on their way rejoicing" till they arrived in that town; but, on taking stock after being seated in the conveyances, the unpleasant discovery was made that one tripod was missing. A hurried run back to the train resulted in the information that the truant tripod would by that time be far on its road to Greenock, and could not certainly be available for that day. But photographers, perhaps more than any other class of the community, have a friendly fellow-feeling for each other in cases of difficulty, and some of the party, remembering that Mr. Birrell, the inventor of the oxyhydrogen apparatus, resided in Hamilton, suggested an application to him, and he most kindly supplied the needed article. *Moral:* While making use of friends to assist in carrying apparatus do not trust to them to see that nothing is left behind.

Bothwell Castle and its surroundings afford ample scope for much picturesque work, including, as they do, the grand old pile, groups of noble trees, and the beautiful windings of the Clyde; but, in consequence of the time lost in the search for sheltered nooks and corners, a comparison of notes at the end of the day showed that only thirty-nine plates had been exposed. It is, however, gratifying to state that, so far as it has since been ascertained, they have nearly all turned out well.

At five o'clock p.m. the party drove back to Hamilton, where full justice was done to a good dinner prepared by "mine host" of the Commercial Hotel. Starting at 8.30 p.m. they reached Edinburgh shortly after ten o'clock, thoroughly pleased with the enjoyment of the day.

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PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

The third annual meeting of the members of this Society was held at 174, Fleet-street, on Monday, the 7th instant,—Mr. W. S. Bird in the chair.

The minutes of the previous meeting having been read and confirmed, the Secretary was called upon to read the report and statement of accounts for the past year. The following is the

Report of the Board of Management.

In presenting the annual report, the Board of Management thank those gentleman who have so kindly contributed to the funds during the past year, and express the hope of a continuance of their support.

Since the formation of the Association it has been enabled to relieve members of the profession, who have had the misfortune to require its aid, to the extent of thirty-five pounds one shilling and threepence (£35 1s. 3d.), varying in sums of five pounds downwards; and, after a most searching investigation into the facts of each case, the Board is satisfied that the amounts voted have been bestowed in a manner the whole of the members will approve of.

A resolution has now been passed that relief shall in future be given to members only. The Association having, up to the present time, been enabled to obtain situations for assistants in reduced circumstances, and to help them at critical moments by prompt pecuniary relief, would urge, therefore, on the profession generally the advantages of joining as speedily as possible. The subscription to the Association for an ordinary member is three shillings quarterly, or five shillings and sixpence half-yearly, or ten shillings and sixpence yearly. The advantages offered are—substantial relief when a member needs it, and railway fares to enable a member to reach a situation at a distance. A list of vacancies is also kept at the office, and applications sent to the Board receive prompt attention.

Taking into consideration the small sum that is required for membership, and the knowledge that, if one does not require assistance, he is at least helping one of his poorer brethren who does, the Board of Management feels satisfied that it is only the want of being more generally known that prevents the Association from having a much larger roll of members.

The Board of Management, in bringing its term of office to a close, would urge upon the members the necessity of their active co-operation in the future, and would request them to make known as widely as possible the purposes for which the Association has been formed, and to forward to their utmost the interests of this Association.

There is still one of the objects of the Association that has not yet been developed, viz., granting annual pensions to aged members or their widows. To carry out this object the board is anxious to form an invested fund, and respectfully solicits donations and subscriptions, which will be thankfully received by the Hon. Treasurer, H. Baden Pritchard, Esq.

After a few remarks from the Chairman, the report and balance sheet were adopted. The meeting then proceeded to the election of officers.

The following gentlemen were elected:—*Vice-Presidents:* the Rev. F. F. Statham, M.A., F.G.S.; J. H. Dallmeyer, Esq., F.R.A.S.—*Treasurer:* H. Baden Pritchard, Esq., F.C.S.—*Auditors:* G. Taylor, Esq.; M. Sisman.—*Board of Management:* W. S. Bird, Esq., *Chairman;* Mr. W. M. Ashman, *Deputy Chairman;* Messrs. W. S. Atwood, H. J. Burton, T. Bolas, J. D. Fage, J. H. B. Hall, T. S. Hicks, E. Lavender, H. Rheinlander, H. J. Thorne, and S. Tyler.

The Board of Management having selected two candidates from the number of applications for the secretaryship, each candidate was separately questioned by the Chairman and members respecting his ability to fulfil the office if elected. Upon their retiring the votes were unanimously in favour of Mr. Harland as Secretary for the year ensuing, and to be remunerated by a small salary and commission. As a further means of increasing the funds of the Association,

The Chairman advocated the employment of a paid agent to introduce the features of the Association to the notice of photographers in the provinces, as the objects of the Association were not thoroughly understood in many places.

It was finally resolved that the Chairman be empowered to arrange with a competent traveller to canvass for members and donations in the provinces, and that the remuneration should be in the form of commission.

Some members present then advocated certain alterations in the rules, and finally the following alterations were passed:—In Rule 2 the word "profession" to be struck out, and the word "Association" substituted; also to add at the end "to duly-qualified applicants." In Rule 4 that the word "benefit" be inserted between "every" and "member;" and that the words "two years" be altered to "twelve months." In Rule 5, line 5, that the words "twelve months" be altered to "six months." In Rule 10, the foregoing alterations being carried, the fifth line from the bottom was superfluous, its erasure giving subscribers a preferable claim. In Rule 16, that the Board of Management consist of ten members instead of fifteen.

After the usual votes of thanks to the Chairman for presiding, and to the other gentlemen for their services during the past year, the meeting was adjourned.

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Correspondence.

THE DEVELOPMENT OF COLLODIO-ALBUMEN PLATES.

To the Editors.

Gentlemen,—In a paper read by the President of the Liverpool Amateur Photographic Association two or three weeks ago, on various dry processes with which he had been experimenting, and in which he has arranged the results, as to time of exposure and development, in a tabular form, I notice that he puts down the development of one of my plates at so much as forty-five minutes; and he further remarks to the effect that, although the resulting negatives are often perfection itself, the time to be expended in the development of a large batch of plates has been a serious tax on his patience.

As I happen to have a slight personal acquaintance with the reverend gentleman, I will remark, at the outset, that I believe no man living is more anxious to be thoroughly fair and honest in expressing himself on a subject of this kind; and, therefore, I hope he will not take it amiss that I should feel unwilling to let the matter pass by unnoticed. I should have replied to him a week earlier had time permitted.

The collodio-albumen process is certainly not a rapid one, and in my circular of instructions this is distinctly pointed out; but since Mr. Palmer has himself seen me develope plates, prepared by myself and exposed by him in Switzerland, in about ten minutes each, it would have been better if he had qualified his remarks by some reference to this fact, or else given fuller particulars as to the means he employed himself.

If the old-fashioned method of immersing the plate in a saturated solution of gallic acid be employed the development may be made to continue for hours, or even days. The subsequent method of getting out the image faintly with a solution of plain pyrogallic acid, as introduced by Mr. G. Wardley, before adding the acid and silver to give density and printing vigour, was a great step in advance, and this plan is still very successfully practised by many; but, for plates prepared for keeping, and in which no trace of free silver remains, the alkaline process is the most natural form of development—a process I invariably practice myself and generally recommend to others. It certainly requires care not to make the pyro. too alkaline and judgment in stopping its action at the right moment, and according as the nature of the subject may demand. These points are by no means hard to master, and, when mastered, the process is neither difficult nor tedious.

Mr. Palmer says he adhered in each case strictly to the printed formulæ sent out by the maker; but for all that it is perfectly possible, as he is so much more accustomed to other kinds of plates, that in this case there may have been some "if" or "but" unwittingly overlooked, which, if taken into account, would have largely discounted what he has said of their slowness. Be this as it may, I rarely find a well-exposed plate to occupy more than ten or fifteen minutes in development.—I am, yours, &c., J. Pollitt.

Manchester, May 15, 1877.

EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale*, that being done at a small cost in our advertising pages. This portion of our columns is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

I will exchange a Ross's quarter-size, or a Dallmeyer's No. 1AA wide-angle rectilinear, for a rapid Dallmeyer rectilinear of six inches focus, or a quarter-plate tourist apparatus.—Address, A. Debenham, 28, Union-street, Ryde, I. of W.

Wanted, a cabinet or whole-plate burnisher in exchange for a whole-plate portrait lens, by Jamin, a fine instrument; or would take a 10 × 8 or 12 × 10 bellows camera and view lens, in good condition.—Address, Hugh Watson, West Bromwich.

A new square half-plate camera, and good stereoscopic camera with pair of lenses by Ross, complete, with changing box for eighteen dry plates, three dark slides for wet or dry plates, in exchange for a 12 × 10 or 15 × 12 camera or group lens.—Address, R. S., 24, Ramsden-street, Huddersfield.

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ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

Notice.—Each correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a *nom de plume* as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

A. A. Swinton.—The proposed tent will answer quite well.

A. A. Campbell Swinton.—1. The acetate toning bath.—2. Starch or glue.—3. Yes.

"Antique Subscriber."—Send name, address, and another negative more carefully packed, the fragments into which the one sent is crushed being too small for examination.

A. Debenham inquires—"Will any one conversant with the neighbourhood give information as to the best routes to take for beautiful scenery in Normandy, or the Coté du Nord, France?"

R. D. P.—Chlorise the image after fixing and washing, and then apply the Schlippe's salt, previously dissolved in water, the strength of the solution being immaterial. Address future letters to "The Editors."

A Would-be Landscapist.—We are well acquainted with the pictures named. The secret of obtaining foliage absolutely still is intimately associated with early rising and securing the pictures before (say) seven o'clock in the morning.

R. Ewing Curwen.—We have forwarded the enclosures. We are aware of collodio-bromide plates having kept good for the time mentioned; but it speaks much in favour of Mr. Cooper's formula to know that such a specimen as that enclosed can be obtained from a negative taken seven years after the preparation of the plate.

G. B. R.—It has been demonstrated more than once in this Journal that pinholes in the negative cannot be caused by particles, crystalline or otherwise, present in the developer. As these particles do not interpose themselves between the developing solution and the collodionised surface of the plate they cannot form pinholes.

E. B. L.—The cause of the defects may be traced to the collodion; this we infer from the diagonal direction of the comets. Filter the collodion through bibulous paper, and if that do not effect a cure nothing remains but to try another sample of collodion. It will also be well to examine carefully the strength and condition of the negative bath.

P. G. (Farnworth).—The manner in which we have seen large sheets of paper salted was by floating them upon the surface of the solution in a large flat wooden bath. The difference between the treatment of a large sheet compared with a small sheet is merely one of degree, not of nature. Some operators prefer to immerse rather than to float the paper.

Young Hopeful (Sheffield).—Commence by practising with the negative of a line engraving the intensification of which has been carried to a great extent. Instead of using the glue you have been trying adopt the carbon tissue of the Autotype Company, and print *very deeply*. Develope, of course, upon collodionised glass. If you follow these directions success is certain.

Medicus.—There is no difficulty whatever in obtaining Fothergill plates which will yield negatives entirely free from such markings as you have described. From numerous experiments we made several years ago, to ascertain the cause of markings on these plates, we know that they proceed from inequalities in the drying. For instance: if a number of Fothergill plates have been ranged inside and around a box to dry, and a heated brick be placed inside, a cover being loosely thrown over all, the mere act of raising such cover when the plates are half dry will sometimes produce markings that no subsequent care in the development will eradicate. Such markings do not occur when the plates are dried at a uniform temperature. If reared up to dry upon an exposed shelf (free from light, of course) no markings will result.

Amateur.—If the film be too pale any increase of density may be given by the addition of more of the iodising solution.

M. N. O.—To every gallon of the washings add about a drachm of chloride of soda previously dissolved. This is rather more than is necessary to effect the precipitation of the silver, but it is better to have a slight excess. The marking on the paper probably arises from an air-bubble. We do not now remember the nature of your dextrine query. See reply to "R. D. P."

Dragoon.—The picture enclosed is faced with a compound layer of gelatine and collodion, and to this its high gloss is due. The collodion is spread upon glass, and when dry a film of gelatine is superimposed. This latter serves as the cementing medium between the collodion and the paper picture. The technical term applied to this method of finishing photographs is "enamelling." Several articles on the subject have appeared in our columns.

Virion Nighton.—The air in the room will be in such a constant state of agitation from your moving about, as well as from the current caused by the gas, that you need not entertain any fear of danger likely to arise from an accumulation of etherial vapours in the vicinity of the floor. Hundreds of photographers work under precisely similar conditions. Our advice is to try the new operating-room for a few weeks, and to abstain from making any alteration until such trial shall have been made.

L. D.—We are not at present aware of the proportions of iodide and bromide employed by Mr. D. Winstanley; but we have known excellent enlargements produced by a bath containing four parts of iodide to three of bromide. With regard to the reticulation of the collodion pellicle: it must surely arise from using impure or weak alcohol. We have never obtained such a result when using the same materials. A note addressed to the manufacturer of the collodion will ensure attention.

Brazilian Amateur.—1. There is no *practical* difference between the two methods of washing the emulsion; that is to say, there is no difference in the results eventually obtained.—2. If the tissue be packed in a tin case properly closed up it will reach you in perfect safety and in good condition. In such a hot climate your carbon operations will have to be conducted in a cool cellar.—3. We think that diluted albumen, or a solution of india-rubber in benzole, will answer better as a substratum than that which you mention.

Young Photo.—Obtain an arm chair of the description usually designated "a library chair," having the seat pivoted, so that it can be easily rotated. In this way the position of the sitter may readily be changed in relation to the camera. We cannot offer such hints on posing a figure as you desire; to acquire this art study portraits of an acknowledged high class, and select a few for imitation. Begin by reproducing such poses in as "slavish" a manner as possible; and when you have in this way acquired one or two standard ideas in posing, you may then introduce such variations and new ideas as appear to be called for in particular instances.

F. Brown.—To obtain photographs by the wet collodion process in the field is indeed an easy matter; but it is not so easy to determine which of the numerous appliances for enabling this to be done is the best and most effective. We have in our recollection several excellent methods by which the wet collodion process can be worked without a dark tent, but are not sufficiently conversant with the practical merits of these systems to be able to institute comparisons as regards their respective advantages. The latest of these mechanical processes introduced is the "Ladies'" camera, patented by, and manufactured for, Mr. W. A. Brice. Although we have not tried Mr. Brice's camera we have seen sufficient of it to satisfy us that it will do all that is promised in that particular direction.

☞ **Editorial Communications should be addressed to "THE EDITORS"—Advertisements and Business Letters to "THE PUBLISHER"—at the Offices, 2, York Street, Covent Garden, London, W.C.**

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LONDON GAZETTE, *Tuesday, May* 15, 1877.

Petition for Liquidation by Arrangement.

W. Cook, Lingdale-lane, Cleveland, Yorkshire, photographer.

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METEOROLOGICAL REPORT.

Observations taken at 406, Strand, by J. H. Steward, Optician.

For the Week ending May 9, 1877.

These Observations are Taken at 8.30 a.m.

May.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks.
3	30·14	E	40	44	51	35	Foggy
4	30·10	E	37	43	50	31	Fine
5	29·91	SE	37	43	51	33	Cloudy
7	29·81	E	45	49	64	36	Cloudy
8	29·77	E	45	52	67	40	Fine
9	29·54	SW	51	55	64	47	Cloudy

The copy for the Meteorological Report for the week ending May 16 did not reach us in time for publication in this number.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 890. Vol. XXIV.—MAY 25, 1877.

ON MOIST PLATES FOR PORTRAITURE.

Most amateurs are in the habit of at least occasionally dabbling in portraiture, and would in all probability devote more time to that branch of the art were it not for the numerous little troubles entailed thereby. The principal trouble, however, lies in the necessity for using a nitrate bath which, in the case of a worker of emulsions, is a sufficient deterrent; but when to this we add the difficulty of keeping the seldom-used bath in proper order, so as to be ready at any moment, it must be confessed that the ordinary amateur has some slight excuse for neglecting portraiture.

But it is our desire to show that it is quite unnecessary to use a bath at all—quite unnecessary, indeed, to employ a single thing not used in the ordinary routine of landscape work. This end is attained by adopting the "moist" process so frequently described in our columns, and brought prominently forward by Mr. P. Mawdsley a short time ago for outdoor work. It is based, as our readers are aware, upon the use of plates prepared as far as a certain stage in the usual manner adopted in the preparation of dry plates; but, instead of drying, the plates are immersed in water or an organifying solution for a few minutes and exposed while still moist. In this state it is claimed for them that they are as rapid as wet plates—some say much more rapid—while there is no doubt as to the saving of trouble they bring to those not in the habit of regularly using the latter form of plate.

It is, indeed, surprising that, comparing the two processes—the wet plate with the bath and wet emulsion—and weighing carefully their respective advantages, so little apparent use is made of the latter. It is perhaps too much to expect that the professional photographer will give up at a short notice the method he has worked for years without first having it practically demonstrated that he will be the gainer thereby; but the amateur who has all to gain and nothing to lose in the matter plays a somewhat inexplicable part. It is probable that this reluctance to use a valuable modification may arise from a misapprehension of its character as well as, perhaps, some doubt as to its capabilities; for photographers are, as a rule, a sceptical race. If this be so it will be our endeavour, in the course of this article, to remove any doubts both as to the nature of the process and its value; and we may say at the outset that, judging from the results of a recent trial, it appears to us that not only may the amateur be benefited, but it may be worth the while of the professional portraitist to develope this method and apply it to the purposes of his daily work.

As regards the capabilities of the moist method: all we can say is that negatives of a class quite equal in every respect to those produced by the ordinary wet process may, after a few trials, be readily obtained by those who have already mastered the alkaline development; while the exposure, as far as we can judge without an actual trial of the two descriptions of plate side by side, is about the same—varying from two or three seconds to fifty or sixty, according to circumstances of light and subject.

We will now turn to the practical portion of the subject, and describe as briefly as possible the *modus operandi*. Speaking of the use of "moist plates" (the name given by the late Mr. Sutton to plates prepared with the bath, washed, treated with a preservative, and exposed while moist), it is, of course, possible to employ any form of film as the basis upon which to work; but for the purpose under notice it is almost certain that emulsions only will be employed. We are not, however, concerned in the earlier stage of preparing the film, but merely take it in hand at that point where, under ordinary circumstances, it is ready for the preservative or for drying. Confining ourselves, then, to emulsions, it will be found that greater uniformity will be obtained by using a washed emulsion, as, owing to the entire absence of soluble matter, the washing water does not become contaminated with bromides. If an unwashed emulsion be employed it will be advisable to adopt the plan of changing the water after immersing two or three plates, in order to prevent the accumulation of soluble matter; and if an organifier be used it is absolutely necessary that the plate be first washed in plain water. An emulsion containing excess of silver does not, under ordinary circumstances, give first-rate results, and iron or plain pyro. development appears to answer better than alkaline.

The next point of importance in the preparation of the plate is the use of an organifier—a matter of much less moment in this process than where the plates are to be dried before exposure. One of the principal functions of the organifier under the latter circumstances is its action in filling the pores of the collodion film with soluble matter, which enables us to restore much of its original porosity upon moistening it after thorough desiccation. With plates which are not dried before exposure it is obvious that this action becomes unnecessary, and the purely chemical functions only of the organifier are called into play. Recent practice shows that even in this respect the use of an organifier in the preparation of the plate may be, to a very great extent, replaced by the addition of the organic substance to the developer, or by its application to the film between exposure and development, from which it may be presumed that the organification of the unexposed film is a needless operation. Such is, in one sense, the case; but with some organifiers it is the more convenient plan of securing the peculiar advantages to be derived therefrom, and in one instance is really to be preferred.

Of the various substances capable of use for this purpose those are to be most recommended whose action is mild in character; thus tannin and gallic and pyrogallic acids are to be avoided unless used in very small quantity, as they interfere materially with the rapidity of action, and tend to the production of harsh contrasts. If an organifier of this class be a desideratum an infusion of coffee forms the most suitable; the strength should be one teaspoonful of newly-ground coffee to a pint of boiling water. The more preferable class of organifiers includes albumen, gelatine, dextrine, and saccharine matter; but, as these are more conveniently used in connection with the development and produce a similar result, it is as well to save the time involved in a separate application before exposure. Unless the emulsion be a washed one we should advise that in no case should the plate be placed direct in the organifier without previous immersion in water until the soluble matters have been removed.

We now come to the only form of organifier which it is absolutely necessary to apply previous to exposure, namely, alkaline, albumen, or gelatine. The treatment of the film with alkali before exposure tends to a curtailment of the time necessary to produce the impression—not, perhaps, by directly affecting the sensitiveness of the film, but by enabling it to render with greater vigour the feebler details. The same effect does not appear to occur with this form of organifier when used after exposure. About three grains of gelatine and one grain of bicarbonate of soda to each ounce of water will be found a suitable strength; but in cold weather this requires to be very slightly warmed in order to keep it properly fluid. For this reason many will prefer to employ albumen (which may be used diluted with about twenty times its bulk of water), and one grain to the ounce of bicarbonate of soda. We prefer the latter form of alkali to ammonia or its carbonate, on account of the volatile character of the ammonia, as well as its slight solvent action upon the bromide of the film.

We have said all that is necessary respecting the preparation of the plates—which differ only so much from moist plates for outdoor use in that they require no hygroscopic matter to enable them to retain their moisture for a considerable time—and will now pass on to the development, in which lies the great secret of success. We have already said that in point of sensitiveness these plates are about equal to ordinary wet bath plates; but it is possible that upon a first trial the verdict may be considerably in favour of the latter. This arises from the very different behaviour of the moist plates as compared with dry ones under alkaline development, to which fact we may turn for an explanation of the varying degrees of rapidity claimed for the former.

It is scarcely necessary to remark that a film which has never been dried must be in a more thoroughly porous state than one which has undergone desiccation and subsequent moistening with dilute alcohol; for, however perfect may be the means adopted to keep open the pores of the collodion, so long as the tendency exists to dry up into an impervious skin it will be impossible to thoroughly prevent it. Owing to their more permeable character the development of moist films is much more rapid than those which have been dried; and this, combined with the universal tendency of the developer to seize upon the more strongly-impressed portions of the image, causes, with the ordinary strength of solutions, an excessive contrast, which produces the effect of under-exposure. We have a choice of methods of overcoming this difficulty: we may either increase the proportion of ammonia or reduce that of the pyro., the latter being preferable. But by adopting a further modification the result is better still. It consists in immersing the plate, when it comes from the camera, in a weak solution of pyro. for a couple of minutes, after which it is developed with pyro. of the same strength, to which is added a sufficient quantity of saturated solution of carbonate of ammonia, but *no* bromide. By this means it appears as if the pyro., while producing no visible effect, prepares the image for the action of the ammonia, the result being that the feebler portions appear almost simultaneously with the high lights, and, owing to the weakness of the pyro. solution, less violent contrasts are obtained. When the details are all out density may be acquired with the greatest ease—either by the addition of fresh pyro. and ammonia together with bromide, or by means of acid silver.

It is in the operation of intensifying that the greatest benefit will be derived from the use of one or other of the organic substances we have previously spoken of—the best of which is, perhaps, glucose, as recommended by M. Chardon; or, if that be not at hand, a solution of honey. The power of giving density possessed by this substance is truly remarkable, and it has the advantage of being equally applicable to either acid or alkaline intensification. The strength of the solution is not very material; we have used it in the proportion of glucose sixty grains, water one ounce. The honey solution which we used some years ago in connection with iron intensification of wet plates consists of one part of honey to four of water. Very little practice will enable the operator to judge of the quantity necessary to produce the desired effect. The colour of the deposit given by the glucose developer is very rich and non-actinic, and by reflected light has a great resemblance to a wet plate.

The details we have given of these manipulations are, at first sight, trivial, and contain little novelty; but it will be found upon trial that they exercise a great effect upon the quality of the result. We can assure our readers that if they follow the instructions here given they will have no cause to repent the adoption of the "moist" plates, either for portraiture or outdoor work.

PHOTOGRAPHY ON THE BATTLE-FIELD.

The "fiery cross" having passed over South-Eastern Europe, belligerent forces are mustering in large numbers. Those verbal pictures of scenes and incidents associated with the carrying on of active hostilities which are so frequently contributed to the public by literary descriptive experts are invaluable; but not less so are those graphic illustrations only furnished by the skilled artist or the photographic adept.

It is not much more than twenty years since photography was first applied in connection with active life on the battle-field. The more experienced among our readers will remember that, twenty-two years ago, Mr. Roger Fenton, the accomplished Secretary of the London Photographic Society, accompanied by the indomitable, ingenious, and clever Mr. Marcus Sparling as his assistant, visited the Crimea, in a photographic capacity, during the severe international struggle which was focalised in that peninsula. During our occasional "outings" with Mr. Sparling, amid other and more quiescent surroundings the latter has frequently reverted to those troubled times, during which, when Mr. Fenton was suffering severely from the consequence of a fall from his horse, he (Mr. Sparling), after having been engaged all day in the photographic tent, preparing, exposing, and developing plates, would, by way of change, spend the greater portion of the night in the trenches, for he was skilled in the use of the rifle.

But since the Crimean war photography has been making progress; and now that Mr. Edward Pocock—of whose recent practical contributions to The British Journal of Photography our readers need scarcely be reminded—is about to proceed to the East in a photographic capacity as the representative of the London Stereoscopic and Photographic Company, we cannot forbear instituting a comparison between "then" and "now." *Then*, a photographic journey to the seat of war implied a travelling laboratory; *now*, thanks to Mr. W. B. Bolton, of Liverpool, and to men of his type, the laboratory—associated with which, in Mr. Fenton's case, were three horses—has shrunk to the dimensions of a schoolboy's satchel. The photographic and personal baggage of Mr. Fenton was comprised in "thirty-six large chests." That of Mr. Pocock will not exceed what he would take with him were he to accompany such a body as the Amateur Field Club on the occasion of a visit to the country on one of their pleasant monthly excursions, supplemented, happily, by the carpet bag so necessary to personal comforts. Still, so far as mere photography is concerned, the satchel will form the chief item in his *impedimenta*.

The photographic baggage of Mr. Pocock is to consist of a portable 7 × 5 bellows camera, a folding stand, a rapid rectilinear by Dallmeyer, and a wide-angle rectilinear screwing into the same flange. Instead of wet- or even dry-plate paraphernalia, the camera is fitted with one of the roller dark slides recently brought in a prominent manner before the public by Mr. Leon Warnerke, whose long bands of sensitised tissue are to be used in preference to sensitised dry collodion glass plates. We have already in a previous number described how in one of these roller dark slides is carried a band of tissue sufficient for the production of thirty negatives, and how such a roller slide, when charged, weighs little more than a double dark slide containing two glass plates, and weighing actually sixteen ounces less than two double slides, which are equivalent in bulk to one of the roller slides.

In Mr. Fenton's case a large sum was expended in nitrate of silver; for the baths very frequently refused to give good negatives, necessitating the preparation of a new one, and owing to the lack of that experienced skill in the rectification of an intractable bath which now prevails the new had to supplant the old at the shortest possible notice. At that time iodised collodion and pyrogallic development held the sway; hence we do not wonder at Mr. Fenton's saying, in the course of his communication to the London Photographic Society:—"As every photographer knows, a nitrate bath must be allowed to rest for some hours after any change has been made in its nature by the addition of either acid or alkali. These additions must also be so cautiously made, and with so many experiments to see if the right point has been reached, that where time is an object it is much better to make a new bath at once; and this we were generally obliged to do, and so the stock of nitrate fell short."

Compare the trials of a photographer at the seat of war continually in a fever respecting the state of his bath and chemicals with one who, like Mr. Pocock, will have literally nothing to do but to select his subject and expose for a few seconds his pellicular film; and, who, when this exposure has been effected, has nothing to trouble him unless it may be the selection of his next picture. We may here observe that such arrangements have been made that the photographer will have nothing whatever to do beyond exposing his plate or, rather, pellicle, and, when the band has been exhausted, removing it, replacing it by another, and forwarding that which has been exposed to this country for development—an operation arranged to be undertaken by Mr. Warnerke. This reduces photography on the battle-field to the simplest possible conditions; for, freed from all care and anxiety of a technical nature, the artist in charge of the camera is quite at liberty to bestow all his attention upon the artistic elements of the picture.

In giving his experience of war-photography in the east, Mr. Fenton said:—"Whatever is to be done by photography in these climates must be done either before the beginning of June or after the middle of September, both on account of the physical difficulties which the artist will have to encounter in the heat of the summer, and also by reason of the inferiority of the pictures which nature presents to him at that season of the year."

But *now*, and under the circumstances described, the extreme heat of summer will prove as slight an obstacle to the photographer as would the colds of winter, because the chemical conditions under which plates are prepared or developed do not in the least degree influence him, both of these operations being performed "at home at ease" in the quietude of a London laboratory. Surely this is the reduction of photography at the seat of war to its simplest elements!

We are pleased to be able to add to what we have written that Mr. Pocock will, from his quarters in proximity to the scene of hostilities, send occasional contributions to this Journal; so that our readers, whether privileged or not with an examination of the productions of his camera, will be favoured with his graphic descriptions in the columns of this Journal.

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A NEW EXPLANATION OF FADING.

We last week referred to faded prints, and also to some that we might term abnormally "permanent ones." From what we then described, and from other circumstances, it is evident that there is still much, if not all, to learn as to the manner in which the destructive agent, whatever it is, carries on its work. Many new facts have been learnt and a storehouse of experience garnered since the somewhat old, but almost classical, researches of M. Davanne and his *collaborateurs* were published. Their conclusions have since been questioned, and some of their statements of facts have been either contradicted or controverted; but no experimentalist has yet arisen who has carried out investigations at all approaching them in the thoroughness and completeness and learning displayed.

That much good must result at the present time from a new series of experiments would scarcely be denied, an opportunity being thus afforded to enable a definite statement to be made as to whether permanency is or is not at the outset impossible under the present mode of treating silver prints. Then we might know for a certainty whether or not carbon was positively to be "the process of the future," or whether the recent crusade against silver in favour of carbon is to die a natural death.

It will aid our readers in grasping the remarks which follow if we recapitulate the causes of fading as at present understood. They can be classed under four heads, viz., imperfect carrying out of recognised processes, incomplete washing, inherent imperfection of the methods employed, and, finally, the action of the atmosphere upon the chemical deposit forming the image. The two latter divisions are closely connected, seeing that it is quite possible to conceive that a print may be perfect and keep perfectly if preserved from contact with the atmosphere, but be quite untrustworthy if the atmosphere be allowed to have complete access to it. It is with the last two phases we more particularly mean to deal at present.

The belief in the permanency of alkaline-toned pictures is strongly bound up with a conviction of the thorough unalterability of the "noble metals," and that gold and silver especially remain unchanged when exposed to a pure atmosphere (the mainly metallic character of the picture being conceded). But it is only a year or two ago since this faith was rudely shaken, and it was shown that an action, probably of a galvanic nature, was capable of taking place between the two metals composing the image. We have to announce the publication of some new facts regarding the possibility of oxidation of silver, gold, or platinum. In a paper read before the Wellington (New Zealand) Philosophical Society, by Mr. William Spey, whose papers have before been alluded to by us, he gives the very remarkable results of some investigations he has been engaged upon, namely, that silver, gold, and platinum are capable of becoming oxidised when exposed to the action of pure water. He arrives at the results after a series of experiments, which he details, and which are chiefly based upon the fact of the inability of any of the metals named to amalgamate with mercury when covered with the slightest film of foreign matter. When rain or spring water was used no difference was perceptible between the action of mercury upon the pure silver and that immersed in the spring water. Electric currents were formed when silver was placed in saline water free from chlorides, iodides, or bromides. In dry air silver was unchanged; spongy silver immersed in a solution of chloride of sodium, in an agate vessel, soon rendered it alkaline. A partial investigation of the behaviour of gold led him to believe that this metal also was oxidisable under conditions similar to those narrated above.

Here are all the elements for fading ready to hand—an image composed of silver and gold (metallic, and in combination with other elements) in a state of the minutest subdivision, surrounded with a slight trace of carbonates, chlorides, &c., from the residual washing water which has evaporated and left them behind, making the paper always slightly hygrometric. Exposed to an atmosphere of varying degrees of humidity, usually containing a considerable amount of sulphuric and other acids generated by the combustion of gas and coal in improperly-ventilated rooms, a continued process of oxidation may be supposed to go on, followed by an action of some sort upon the oxidised products by the acids ever present in the atmosphere. Synchronously with this action one of a less prominent form may be taking place with the gold, and the whole may be greatly increased by a galvanic action, which, under sufficiently-marked hygrometric conditions, might readily be supposed to take place—all these actions, of course, being understood to be of the slightest and most delicate extent, their effects only being visible after a considerable lapse of time, varying according to the state of the print and the conditions of its exposure. We do not now intend to point out the precise reactions which would most likely take place, but only the direction in which they would lie.

That the fading—alas! far too frequent—of which we see so much is considerably modified or prevented when access of air is denied to the print is pretty well known. It has been pointed out before that when a heap of photographs have been stored by for a number of years and then unpacked, the signs of fading, if any do exist, are always to be looked for in the parts most exposed to the atmosphere—that is, the edges of each print; and the nearer we approach the centre of the packet, where the air has access least, the less do we find the picture faded. Could it be asserted with certainty that in a perfectly pure, dry atmosphere no fading would take place rendering the picture "atmosphere proof" could readily be done; for nothing would be required but a good impermeable coat of varnish—a method which has been before alluded to in these pages, and of which the old enamelling with "encaustic paste" was but a branch.

We have reason to believe that some eight or ten years ago a considerable number of varnished pictures were sent out by various photographers, and the enamelling by a turpentine and wax paste was far from uncommon—one firm in particular, to our personal knowledge, going to the trouble for some years of so "encausticising" every picture they sent out. There must still be some thousands of these pictures in existence at the present moment, either in the albums of the sitter or the store cupboards of the photographer, and it would now be very interesting to ascertain their present condition. An examination of them might throw much light upon this question of fading. We hope, if there are any such pictures at present open to examination, that some of their producers will report on their state to us, accompanied by any other particulars having a useful bearing upon such knowledge. It is not, of course, to be expected that, under any circumstances, all should be free from fading; only those carefully and conscientiously prepared could reach this excellence. Silver will fight hard before it dies; and it is indeed so very beautiful that if only the stamp of permanency could be imparted to it one could desire nothing better.

We have heard such good accounts of the capabilities of the lead intensification process of Herren Eder and Tóth that we had come to accept it as a fact that all the difficulties attending the production of negatives in line for typographic or lithographic work had been removed, but had no opportunity of personally testing the truth of this belief until two or three weeks ago, since which time we have had sufficient experience to enable us to speak from our own knowledge of the results. The experiments we have made place beyond all doubt the immense power conferred by this process in securing any density whatever with images originally beyond all apparent hope; but, while developing the capabilities of the process, we have also become acquainted with some of its disadvantages or, rather, defects. In the first place, with ordinary collodions and in the absence of any substratum, we find it almost impossible to retain the film upon the plate when dry, unless a tolerably strong solution of albumen be poured over it after the final wash. Possibly with a substratum or with a more tenacious collodion this difficulty may disappear. The next defect is the extremely granular character of the deposit, most noticeable when chromate of potash is employed to change the lead picture. When sulphide of ammonium is used it is not so evident, owing, perhaps, to its being hidden by the darker colour and opacity of the picture. It exists, however, in the white deposit formed by the lead solution, and appears to arise from the presence of more colouring matter than the collodion film is capable of containing. After the film is stripped off the glass an image remains, consisting of adherent powder, which has been formed between the film and the glass. Add to these the fact that what appears to be perfectly clear glass before intensification frequently comes out after that operation sufficiently dense to form the half-tones of a tolerably dense negative, and it will be seen that we have not yet surmounted *all* the difficulties in intensification.

PORTABLE NEGATIVES BY THE GELATINO-BROMIDE PROCESS.

The desire and aim of every amateur who loves to take his camera in his mountain excursions is undoubtedly, if I judge by my own feeling, to obtain negatives as rapid as wet collodion, as light as paper, and that will keep well before and after exposure.

I am aware of the introduction of "sensitive tissue," which solves the problem; but many amateurs may be deterred from using this by its high cost, while others like to know how to prepare for themselves their own materials. I confess I am one of the number. I shall, therefore, give them the benefit of my researches, and run the risk of finding out that my "discoveries" are "as old as the hills," and have been known years ago by some photographer of "the far west" or elsewhere.

The gelatino-bromide process giving all that can be desired in the way of rapidity and good keeping qualities I have adopted it (I use Mr. Kennett's pellicle). The question is how to spread the gelatine evenly on a temporary support of great lightness. It is necessary for this purpose to find a paper so thoroughly glazed that the gelatine will not sink within its pores, and to coat this paper with a substance that will hold the gelatine secure from blisters during the various operations and yet allow it to be peeled off when the negative is finished; in fine, this paper must be as flat and as rigid as glass, so that the gelatine may form a perfectly smooth and even film.

After a good many trials I have arrived at complete success by using the following method:—

Take paper covered with insoluble gelatine (such as the Autotype Company and Marion and Co. prepare for the single transfer carbon process; coagulated albumen paper may, perhaps, also answer, but I have not tried it); cut this paper half-an-inch larger all round than the glass plate used in your camera; cut a half-inch square off each corner, and soak this paper in cold water for five minutes. If you have any doubt about the gelatine being really insoluble soak in a two-per-cent. solution of chrome alum, instead of in plain water.

Lay your paper face downwards on a sheet of damp blotting-paper; place a glass plate on the top, and on the glass plate a sheet of ordinary paper cut to the exact size of the plate (or a little smaller), and well expanded in water. Now turn upwards the projecting edges of the gelatine paper and gum them with strong Scotch glue to the plain paper at the back of the glass plate, and place the whole between folds of blotting-paper under a moderate pressure.

When quite dry place this plate (now completely encased in well-tightened paper), face upwards, on a warm plate of metal (such as the top of an iron stove or kitchen range, on a pad of brown paper), and when it is quite hot rub the gelatine surface with a piece of white wax. Go on rubbing till the paper is quite soaked and the wax has penetrated freely between the paper and the glass. Now take the plate off the hob and rub the surface gently with a piece of flannel until all the wax is evenly spread and the surplus wiped off the surface of the gelatine paper. If any air-bubbles appear between the paper and the glass it is a proof that you have been too sparing with your wax, and you must begin again, such air-bubbles rendering the plate quite useless.

Place, now, the finished plate, face downwards, against a sheet of clean plate-glass, or, better still, against the face of another plate similarly prepared with waxed gelatine paper. Several plates can thus be piled up face to face and back to back. Place the whole under moderate pressure, so that, as the wax hardens, it may fix the paper to the glass and give it a perfectly smooth and rigid surface.

All this may appear a little complicated, but it takes really longer to describe than to work out. It is probable that other methods can be found for fixing a sheet of waxed paper to a glass plate; thus paper may be dipped into melted wax or paraffine and spread on a plate with a squeegee. I have not tried any other method than that described above, and it answers well in my hands.

The plate can now be taken to the dark room and coated with warm bromide of silver gelatine, just as ordinary glass plates would be; drain slightly, and place on the shelves of the drying cupboard. When quite dry run a knife along the edges and peel the waxed paper off the glass by inserting the blade of a thin paper-knife.

These sensitive sheets can be fixed to cardboard and placed in the dark slide, or they can be made up into "blocks," as Mr. Warnerke does with his sensitive tissue.

After exposure soak the sheet for a few minutes in cold water, spread it on a glass plate, and develope in the usual manner with alkaline pyro.; fix, wash well, and pin the sheet on a flat board to dry. It is necessary to allow the film to dry thoroughly before proceeding further. The gelatine is not insoluble until it has dried once; after that it may be treated with hot gelatine without risk of dissolving or adhering to the waxed-paper support.

When quite dry prepare some plain gelatine as follows:—For the half-plate size soak seven or eight grains of Nelson's brilliant gelatine in cold water for fifteen minutes, drain, add three drops of glycerine, dissolve by heat, add ten drops of a two-per-cent. solution of chrome alum, filter through muslin into a bottle, and keep it warm for use.

Now take your paper negative and fold up the edges so as to form a shallow dish; soak in cold water for about half-a-minute, drain, and spread on a sheet of glass carefully levelled. See that the edges are well turned up, and pour the warm prepared gelatine so as to have a good coating of about a sixteenth of an inch. You can spread the gelatine up to the corners with a soft camel's-hair brush. When the gelatine is well set slip your paper negative off the glass plate on to a thin board, pin the corners and sides, and place it in a current of dry air away from dust and grit. It will dry in a few hours, but it must be thoroughly dry before you attempt to separate the gelatine film from the waxed-paper support. This is done by trimming off the edges and rubbing the back of the waxed paper with a tuft of cotton soaked in turpentine. After a minute or so the edges separate; insert the blade of a thin paper-knife, and peel off carefully.

I shall not describe the pleasure this last operation affords to the amateur when he sees a beautifully-transparent negative film rising slowly from a dingy paper support under the pressure of his paper knife; but I trust that many will experience this sensation.

These gelatine films can be stored between the leaves of a book; they will stand the usual wear and tear of the printing-frame, and can be printed off from both sides—a valuable quality for those who have adopted the single transfer carbon process.

Lyons, May 14, 1877. EDW. MILSOM.

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CARBON *VERSUS* SILVER.

THERE has been so much written of late on carbon *versus* silver prints that it may seem either impertinent or useless for a new hand to pen a few words. My excuse must be its paramount importance and a lingering love for an old friend, especially when he has so many good qualities, and his greatest enemies can find only one fault in him.

Mr. J. A. Spencer is candid enough to admit and point out that silver photographs fifteen years' old are still beautiful to look upon.

I had an application a short time since for a negative taken in July, 1864. The person brought a print done at that time, and I was astonished to find, after all one has heard lately about silver prints fading, that it was quite as clean and brilliant as anything that can be done today. I wanted to beg or borrow it, but it was all he had, and as the lady was dead he would not part with it. On looking his album over I found one taken by me in May, 1864, which I enclose.

The question naturally crops up here—How is it that these are so good at the end of thirteen years, and many not two years' old are showing signs of decay. It may, perhaps, interest your readers and recall pleasant associations to others when I tell them that on referring back I find at that time I was using "Sutton's patent" paper, sent out by Messrs. Lampray and Co.

Is there no paper-maker sufficiently enterprising to give us the good paper of other days? Or have we gone on progressing backwards till they cannot do as they did then?

I have not a word to say against some carbon prints I have seen. They are as nice as anything need be. But this is the stumbling-block—it is a fact indisputable that some *so-called* carbon prints have shown signs of "yellow fever." When silver prints fade we are told that it is inherent in the process. When carbon prints do likewise the excuse is that the tissue was prepared with fugitive colours. Can the folks who are just now going carbon mad give us the same beauty in a carbon print that can be got in silver without the use of fugitive colours?*

It is quite the fashion to have new sensations, and to me it seems probable that carbonism is of this school—to be pushed on one side when those most interested are enjoying the fruits of their labours. I know I am one of a large number who believe that competition in producing cheap paper has deteriorated the quality very much, and we are willing to pay a good price for the old quality.

It is a sad reflection on a progressive art like photography that we cannot buy today as good paper as was sold in the early days of the business. VOX.

Manchester, May 21, 1877.

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CONCERNING DEVELOPMENT.

I ALMOST feel that an apology is due to the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY for the title of this article, for so much has been already written on the subject that it may be well nigh considered overdone. But it is just for the very reason that so much has been recently written, and so many new ideas broached, that I venture to come forward with my own experience. I am also mindful of a request addressed to me some weeks ago through the correspondence column (and which, owing to other engagements, has unfortunately remained unanswered) for the best method of developing the plates prepared by the washed emulsion process, published by me in the last volume. I now take this opportunity of replying to that query and, at the same time, of describing my method of developing plates prepared with a slight excess of soluble bromide.

In speaking of the best mode of development for any class of plates it is of course to be understood that the image has been formed by the *best* possible exposure; that is to say, it has received a sufficiently full exposure to render anything like forcing the development unnecessary, without carrying it to excess and thus losing delicacy. If the exposure be curtailed or increased beyond certain limits the best mode of development for that particular plate becomes entirely different, and under such circumstances it is impossible to give any formula or any plan of action which may not be unsuited to the exigencies of the case. Hence I can only satisfy my querist in a general way.

I may state at once that my first principle of development with plates prepared by my own formula (in which I eschew free silver) is that, given a properly-exposed plate as defined above, the smaller the quantity of ammonia used in the development the better will be the result and the quicker and easier will be the intensification. In the earliest stage the proportion of pyro., too, may be reduced below the original standard of three grains to the ounce; but as this does not affect the result so materially as the strength of the alkali, and in the event of an error in exposure may have an injurious action, I do not press it. I am now speaking of development under the most favourable conditions; but the more the exposure is reduced, and the more we endeavour to perform remarkable impossibilities in the way of short exposures, the more will it be necessary to increase the quantity of ammonia. If the final result were equal in both cases I should say "by all means use the strong ammonia;" but I am sorry to say that neither with my own plates nor with any that I have tried are the results at all comparable. If the exposure be too long, the weak mode of development I recommend affords greater facilities for arresting the action before it has proceeded far enough to ruin the result. With this explanation I may proceed to describe my method.

After moistening the film with ordinary methylated spirit it is washed and flooded once or twice with plain pyro. solution, the strength of which may be from one and a-half to three grains to the ounce; this is returned to the developing cup, and one or two drops of a sixty-grain solution of carbonate of ammonia added to each half ounce. With this the picture is developed until all necessary details are faintly visible. In some cases, where portions of the picture are much more feebly lighted than others, it is possible that one or two drops more of ammonia may be needed; but under ordinary circumstances the quantity I have named will prove sufficient.

The first stage being completed I proceed to intensify with a solution of carbonate of ammonia twelve grains to the ounce, which is formed by mixing one drachm of the sixty-grain solution with four drachms of water, to which are added ten drops of a ten-grain solution of bromide of potassium and sufficient pyro. (in strong alcoholic solution) to make three grains to the ounce. I prefer the sudden transition from very weak ammonia to the comparatively strong solution for various reasons:—First: the acquisition of density is more rapid. Second: the details being already formed intensification without simultaneous development of further detail is secured. Third: the tendency to heaviness in the half-tones which is common with alkaline intensification is reduced to a mimimum. Fourth: in consequence of the rapidity of the intensification there is less risk of fog. By gradually augmenting the strength of the ammonia intensification and development proceed concurrently, by which there is a tendency to fill up the half-tones and give a flat result.

If this treatment do not produce sufficient density (which I prefer to be the case), wash the plate thoroughly and flood with plain pyro., a grain and a-half to the ounce. Allow this to soak for fifteen seconds or so, then add a few drops of a solution composed of—

Nitrate of silver	30 grains,
Citric acid	20 ,,
Acetic acid	2 drachms,
Water	1 ounce,

and proceed until sufficient density is reached. It is quite easy to obtain much more than the required strength with alkaline pyro. alone; but, for the same reasons enumerated above, I prefer a final touch with acid silver, as the brilliancy conferred by that style of intensification is, to my eye, much greater than can be attained, except under most favourable conditions, without silver. If the silver be used moderately there need not be the slightest fear of producing harshness.

Let it be fully understood that I do not put this method forward as "the best" under all or perhaps any circumstances; it is the best I have used with my own plates and others prepared with free bromide. Those plates prepared with free silver require very different treatment, strong ammonia being a *sine quâ non;* but even under the most favourable conditions I do not think the results will compare with those obtained upon slower plates prepared without excess of silver. W. B. BOLTON.

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* The yellow tint referred to may possibly arise from the bichromate having been imperfectly removed. With regard to the permanence of the pigments used, we understand that the Autotype Company are now making tissues the colours of which are permanent even when exposed to the continued action of light.—EDS.

NOTES FROM AMERICA.

Business Prospects in America.—The "Positionist."—Cleaning Glass Plates.—Theory and Practice.—New York Photographic Fashions.—Hints to Carbon Workers.—Burnishing Prints.

It affords us much pleasure to learn from the *Photographic Times* that business prospects in New York are exceedingly encouraging. Our contemporary observes:—

It has been so long since we could say a cheerful word on this subject that it seems really refreshing. Like the loosening, icy bands of winter, from which the laughing streams have escaped, and now go dancing down the hill side, so does the stringency of the times seem to be relaxing, and the streams of business begin to fill their wonted channels. The settlement of the long-continued presidential contest seems to have restored confidence; men begin to look into the future with some degree of certainty as to what is to be, and a better tone is beginning to pervade nearly every department of business. We have had many letters recently from Chicago and the West which refer to the revival of trade, and give a very hopeful outlook for the future. We also hear of improvement in many of the manufacturing interests of the east. Gold is down to a mere nominal premium; the prices of all the necessaries of life have fallen to a reasonable standard; the inflation bubble, which has existed ever since the war, has about collapsed, and business men can now start out on a firm and healthy basis.

There are departments in the photographic business in America which are scarcely yet recognised in this country—at least by name. For instance: among the advertisements with regard to vacant situations, and aspirants for such, it is no unusual thing to meet with such an announcement as the following:—"A *positionist* of experience, who has worked in the best galleries, desires a situation."

Mr. I. B. Webster, in an article on cleaning old or new, varnished or unvarnished, glass plates finds fault with some who, while professing to have carried out instructions previously given by him in relation to this subject, have not done so in reality. In consequence of this he communicates to the *Philadelphia Photographer* such a fully-detailed method as cannot fail to ensure success. Mr. Webster proceeds:—

Make a strong solution of concentrated lye. Immerse the glasses in it *one at a time* (I treat varnished negatives and new glass alike), and leave them in the solution until they are clean; then, with a rag, tuft of cotton, or patch, wipe them (rub hard) all over both sides, and then wash the lye all off with water, after which immerse them in a dish containing commercial sulphuric acid (strength unimportant), where they ought to remain at least one whole day. Take them from the acid singly, let them drip well, wash in water, and pass them into water where they will remain until they are ready to albumenise. Do not allow the glass to dry from the time it is first put into the lye until after it has received the substratum of albumen. *This is an important point.* I am working up to this routine and my supply of rusty glass is diminishing rapidly, and I fail to get a "map of the world" on my negatives. By giving a little attention to this every day it will be but a short time until you will find a large supply of good plates on hand ready for use. I use the white of one egg to from ten to twenty ounces of water, and add a little iodide of potassium to clear it and a few drops of ammonia to improve its keeping qualities. If the solution is too strong of egg the film of the negative will come out rough. Filter with care before using, and be careful in setting the plate away to dry in order to prevent foreign matter from coming in contact with the albumen surface while wet. Above all things have your hands free from silver, soda, cyanide, or other deleterious solutions, or it is sure to spoil all your plates. Use a rack to dry the plates, as that gives a chance for the solution to run off the corner, and, besides, there is no fear of capillary attraction carrying some destructive element upon the surface. Of course old readers will fail to see any good in this re-hash, nor would I two months ago; but my late experience teaches me that even old ones can learn if they will. I write this for those who read, and ask them to *think* it over.

In an article in the same journal, by Mr. F. M. Spencer, on *Theory and Practice*, that gentleman makes several observations of an excellent character, which will find acceptance with many of our readers, extracts from which we subjoin:—

Let us consider for a moment what are the true qualities of these terms, "*theory*" and "*practice*"—terms so often antagonised. The plodding manipulator is apt to sneer at *theory*, forgetful that at least only a small percentage of his skill acquired by imitation or transmitted to him as naked facts unaccompanied by the philosophy—the bedrock of abstract principle upon which they depend—is the result of accident or blunder that must be repeated until the fact, without the *why*, becomes apparent. He is apt to display a pitiful ignorance of the truth that nearly all practical knowledge is based upon theory; that daring, noble, brave thinkers have evolved the great mass of all knowledge by a process called theorising, by putting together facts already demonstrated, and drawing deductions by analogy based upon well-known principles; or from observations of the processes spontaneous in nature, and applying the established principles of natural law, theories are arrived at that may be either established as *facts* or delusions, by a process called experiment or demonstration. It is often necessary that a great number of experiments should be made to establish the truth or fallacy of a theory, for if the theory be a true one it is also a fact capable of demonstration; but it does not at once follow that the theory is false because the demonstration fails to establish the truth. The application of the process of demonstration may be erroneous, teaching us that we ought to be very cautious about arriving at a conclusion hastily, and it also teaches us not to be contemptuous of what is called theory. Photography is the offspring of theory from the very first conception down to the latest application. It has enlisted an army of brilliant minds, including some of the rarest genius of the nineteenth century.

Our professional readers will be glad to receive information as to the newest photographic fashions now being introduced or adopted by some of the leading photographers in New York. The newest ideas in backgrounds form the theme of an article on *Fashions* in the *Practical Photographer*. This is as follows:—

Of so great importance have become the backgrounds used in photographic portraiture that we have selected them as the subject for this month's consideration. Winter, "lingering in the lap of Spring," is illustrated at Sarony's, where a dreary waste of snow, covering hill, dale, and river, is depicted on one of the backgrounds, still to be seen under his easterly skylight. This has done good service during the closing winter months. With it children sliding down a hill, young gentlemen skating, and many other scenes incident to wintry weather have been successfully represented. At this gallery of art interior backgrounds for full-length figures are mostly of the *renaissance* school, executed with great dash and vigour. There is, however, an indication that the Eastlake or modern gothic will be used to some considerable extent after May 1st at the new gallery in Union-square. A handsome conservatory is frequently used for daintily-dressed young ladies. The head and bust backgrounds are comprised of a very light one with shadings similar to the standard Rembrandt, and a rich shaped woollen one for three-quarter length and standing figures. For children, under the special quick skylight, is used an interior with a plain wall, an open door on the left, and a cabinet of *bric-a-brac* on the right, all somewhat in miniature. The highest form of theatrical portraiture still forms a part of the business of this gallery Backgrounds are painted for this branch from sketches which have been made in the theatre during the progress of the play—set pieces, arranged as on the stage, being frequently used. Rockwood uses a tapestry interior in conjunction with an antique cabinet for imperials, and for groups a background representing a room with massive marble columns. The centre of this ground, being quite plain, is used for three-quarter lengths, sitting and standing. At the new gallery of Fredericks and O'Neil, Broadway, corner of Ninth-street, a seashore, in connection with artificial rocks, is used almost exclusively for children, many beautiful results attesting their value. A garden with dense foliage is used for adult standing figures. Frank E. Pearsall, of Brooklyn, has hit upon an entirely new idea. For three-quarter length standing figures he uses a background about five feet in width by seven in height, arranged to slide up and down in a frame, the centre of which is a charming bit of sky, sea, and shore, painted within a space of from three to four feet in diameter, the edges being lost or vignetted into the rather light neutral tint covering the balance of the canvas. This background is used principally in his non-distorted prints, also an invention of his, and we understand protected by letters patent. His pictures are pearly, have an air of elegance, and are strong and rich when the subject has worn dark drapery. At 707, Broadway (Mora's), we find an unusual number of backgrounds in use, the custom being to introduce from one to two or more new ones monthly. They are stretched on frames, one on each side. These frames have no permanent feet, and are hung when not in use side by side to hooks in the ceiling near the south wall of the operating-room. About twenty backgrounds are thus arranged, and a moment or two suffices to take one down, attach portable feet, and place it in position. A great variety of exterior and interior scenes afford an opportunity for the artist to select a background in accordance with the style of dress and social standing of the subject. A new feature at this establishment is a series of eight backgrounds, each five feet by six feet, for the various positions of light and shade desirable in head and bust pictures. Outdoor and indoor accessories, real and imitation, are highly esteemed by the proprietor. At the Kurtz gallery, for head and bust pictures, the concave *papier maché* background (the well known invention of Mr. Kurtz), painted a canary yellow, is used. An elaborate interior exhibited at the Centennial by Seavey is one of the latest acquisitions. From twelve to fifteen backgrounds, each designed for a special use and place, are in daily use, rustic accessories and fine cabinet furniture playing important parts.

A number of useful hints to carbon workers have been contributed to the last-named journal by Mr. James Inglis, of Montreal. In the course of his trials with the Lambertype process of carbon printing Mr. Inglis had met with numerous difficulties and drawbacks; but by perseverance he eventually discovered where all his troubles lay, and since making this discovery he is able to affirm that the process is simplicity itself. His first great mistake, he says, was in deviating from the rules laid down by M. Lambert. He was much given to cutting a road for himself, and, though he would not advise any chromotypist to do so at the beginning, he had himself found great benefit from having done so. Of course the road was a hard one to travel, and he was very near backing out; but, just before giving up and confessing that he was beaten, he began to meet with success by degrees, and now for the past few weeks he has been getting into the way of working it with great ease and pleasure. Mr. Inglis gives the following hints to workers:—

> For the good of carbon workers, who may be troubled in any weather with their tissue drying too hard, I would recommend them to put it into a fuming box, and place a flat dish of hot water beneath it for ten or fifteen minutes, when they will find it as pliable as a piece of patent leather; roll it up and put it into a tin box, when it will keep this way for a long time.
>
> There has been a great deal said about mounting the chromotypes. Now, the *best possible* way to mount them is with gelatine. I have a tin pan that holds a gallon or so, which I keep always ready when I want to use it. I heat a few minutes until redissolved, put it into a developing tray the size of the plates my pictures are on; soak the cardboards a few minutes, which are to be the same size as the whole of the pictures on the glass. Now, with a small sponge, rub over the back of the pictures a little of the gelatine, then lay on the cardboard and with a printer's hand-roller roll out the surplus gelatine back into the tray, and with another sponge and under the tap wash off the gelatine from the back of the card and face of the glass; then squeeze the cardboard tight down, pile them all on top of each other, and leave under pressure for an hour or so; then take and bind around the edge with strips of wood and spring clips, set them aside to dry, and when dry they will come off perfect and in full gloss. I prefer rolling them afterwards on a cold plate—not through a burnisher, but on a *flat*-bedded roller. It gives them a very fine gloss with a nice grainy appearance, and takes away a little hardness which "glace" pictures generally have (especially as I see them). I now cut them out upon a piece of lead, with dies round-cornered, the size of *cartes* and cabinets. With these same kind of dies I make my masks and tinters, at a cost of about five cents, instead of the Lambert frames at $2 25 each; making a masker and tinter $4 50, while mine is *a great deal better every way for ten cents.* Instead of using the gelatine with the name printed on it I have a rubber stamp, with which I print the name, &c., direct on the glass, doing away with the troublesome medium of the gelatine. I have no doubt that, after we get a year's practice or so at it we will have the process simplified to a much greater extent. Silver printers have no conception of the beauties of this process. I could take in hand to convert the most conservative in half an hour.

It is undoubted that to American photographers must be awarded the palm, as respects priority, in connection with the adoption of burnishing prints. Various hints as to the most effective method of securing this end have from time to time been published; and in a recent number of *Anthony's Photographic Bulletin* Mr. C. F. Kinnaman says:—

> For the benefit of those who are willing to learn and let learn, I will give my way of making them (the prints) shine. For a lubricator use the following:—

Alcohol	3	ounces.
Liquor ammonia	¼	ounce.
Glycerine	2	drachms.
Entrekin's lubricator	10	grains.

> Mount the prints while wet; let them stand until the ends of the cards curl up a little, and apply the lubricator with a small sponge. Let them stand twenty minutes and then "shine them up."

Although we are not quite certain of what is meant in the foregoing formula by "Entrekin's lubricator," we presume that it is intended to mean a very weak solution of Castile soap in alcohol.

Another correspondent, Mr. A. S. Barber, writing to the same journal, says that he finds in his experience carbon prints burnish best without any lubricating. It will be in the recollection of many of our readers that a few years ago we published the fact that absolute dryness of the print was an essential requisite in the successful burnishing of carbon pictures.

SCIENTIFIC JOTTINGS.

One of the most notable events of the past month has been the annual *conversazione* of the Royal Society—a meeting where it is customary to find all the instrumental scientific novelties of the past year, with, generally, some striking new optical or philosophical apparatus. Among the latter this year were to be found the otheoscopes of Mr. William Crookes, F.C.S.—a series of instruments suggested by his investigations in connection with the radiometer, and in the designing of which the impulse-of-light theory has been quite discarded. The older instrument is moved by the influence of radiations, but it is now practically considered as a *heat* engine; and Mr. Crookes's design has been to invent a heat engine where the molecular pressure could be most thoroughly taken advantage of. The action of the new instrument may be briefly described as an objective instance of the increase of rapidity of motion in the molecules of a gas brought about by their collision with a heated surface, their motion being imparted to a freely-suspended adjacent body as they impinge against it. This new instrument will act equally well without a case if taken into a sufficiently rarefied atmosphere, while the radiometer would have no motion in any atmosphere (or in none) if the glass walls which surround the vanes were removed.

Among the other objects of interest exhibited may be named an automatic spectroscope, capable of being used with two, four, or six prisms, with solar eyepiece arrangement. There was also, to use with this instrument, a heliostat exhibited. In connection with optical instruments there was also shown an induction coil, containing 280 miles of wire in the secondary coil. We should be inclined to imagine that this huge instrument ought to be able to produce light enough to photograph by. We may possibly hear something of its power in this direction.

A new spectroscope has been invented in which half prisms are used to magnify the dispersion. As an example of its power we may note that a two-prism spectroscope of the new construction showed the D lines widely separated. The new form has been the subject of fierce discussions in the societies and among scientific investigators, our esteemed contributor, Professor Piazzi Smyth, with others, having taken part in them. The supposed disadvantage lies in want of definition, in which case its employment would be fatal to photographic excellence; for just as in a microscope definition and not amplification is what is required, so in registering the spectral lines no amount of increase of size will counterbalance want of clearness in their definition.

Dr. Janssen—to whom this subject owes so much, and whose services in connection with the transit of Venus expedition will be fresh in our readers' minds—has removed his photographing apparatus from the Boulevard Ornano to Meudon, where he is establishing a permanent physical laboratory, at the expense of the Government, in a barracks given for the purpose by the French War-office.

The deductions with respect to the transit observations were reported by Mr. Ward Hunt in the House of Commons about a month ago as likely to be ready in about six weeks' time. He stated that they would be incomplete without the completion of the photographic records, which would take some months yet.

A new astronomical periodical is announced under the title of *The Observatory*, the first number being advertised to contain, among other articles, *Photographic Spectra of Stars*, by W. Huggins.

We may expect photographic chemicals from a novel source. It is announced that Mr. H. Giffard is constructing, near the Champ de Mars, Paris, a workshop for producing hydrogen gas for inflating a large balloon, the gas being made by the action of acid upon iron. It is expected that "the sale of the sulphate of iron produced will almost cover all the expenses, so that numerous scientific ascents may be made during the ensuing summer."

A further source also is mentioned of a deposit likely to be of use to photographers—tripolite. Mr. W. M. Patterson has communicated to a scientific contemporary an account of an examination he has made of a substance supposed to be clay, but which turns out to be nearly pure tripoli. It was taken from one of the highest of the Grampian Hills—Ciste Mairearad, Invernesshire. Mr. Patterson finds it to correspond closely with a sample from the Puy de Dôme, France, analysed by Fournier.

Interesting statistics of the iodine manufacture are given by E. C. C. Stamford, F.C.S., from which we learn that, by means of a new process he has introduced, the yield from seaweed can be more than doubled—an important consideration, seeing that the extraction of iodine from the mother liquors of the caliche of Peru has greatly altered the trade in this country, the original twenty manufacturers in and near Glasgow having now dwindled down to three. A bye-product from Mr. Stamford's process is a charcoal with an extraordinary power of absorption. It would be strange if this also should turn out to be of use in photography. Mr. Stamford has made several analyses of one particular seaweed from which iodine is extracted—*Fucus serratus*, or black wrack—but has not been able to confirm the statement of previous investigators that silver is contained in it.

We read, in a communication from Vienna, that all varieties of sulphur are found to be moderately soluble in warm concentrated acetic acid, although almost insoluble in ordinary dilute acids. By cooling or evaporation the sulphur is deposited in the form of long, beautiful needles. It is just possible that the germs of a useful process for detecting sulphur in paper may herein be found. It has been recently affirmed that the use of antichlor in paper manufacture, to remove the chloride of lime, invariably results in the precipitation of sulphur in the pores of the paper.

Professor Barff—whose method of oxidising iron we lately referred to—has recently been lecturing upon it, the details he gave of the experiments he made being highly interesting. Pieces of iron left by the seashore for months, or exposed to the action of dilute acids, failed to show any trace of rust or surface disintegration. If further practical trials prove it to be as useful as it appears to promise, its value in keeping photographic rolling-presses, &c., free from rust cannot be too highly estimated, the rusting of these essential *impedimenta* being a constant source of trouble to the photographer. A coating of nickel is sometimes used to effect the same object, and now a fresh mode of producing such coating has been recommended. It consists of immersing the object in a solution of zinc chloride in nickel salt, raising to a boil, and bringing the metal to be coated in contact with metallic zinc. A coating of cobalt can be obtained in the same manner.

The perpetual squabble as to the composition of gun-cotton still crops up now and then. MM. P. Champion and Pellet, in *Comptes Rendus*, seek to show that it is a penta-intrated product, and not, as generally supposed, trinotro-cellulose.

A new quality in bichromate of potassium has been discovered. M. Laujorrais, in the same journal, has stated that beer mixed with the one-thousandth part of this salt does not turn sour, and that meat, gelatine, and vegetable matter can be preserved by its agency, even if freely exposed to the air. This will account for the fact, not hitherto noticed, that the bichromate bath preserves its qualities and freedom from offensive odour so long, though it must contain much easily-decomposable matter after frequent use.

The subject of fluorescence has been receiving attention at the hands of M. Lommel, whose treatise on optics we alluded to when published. The results of his investigation are published in *Poggendorff's Annalen*. He states that there are two kinds of this phenomena. In the one homogeneous rays were capable of exciting others of wave length of both greater and smaller and also of equal size; and in the other only rays of greater or equal wave length. Among the latter may be classed naphthaline, eosine, and red chlorophyll. M. Lommel also describes a third kind of fluorescence which partakes of the qualities of both.

An interesting account has also lately been published about thermometers and the mode of testing them. It is not generally known that anyone who chooses can send his thermometer to Greenwich to be tested, a small fee of about a shilling or eighteenpence being all that is required for a complete examination of the instrument, which is recorded in a printed "testimonial" of its merits—all its imperfections, if any, being marked on the "character" with great accuracy; and it is surprising how many of the best thermometers are, at one point or another of their range, imperfect or irregular in their indications. Previous to the year 1875 the apparatus employed was of a singularly primitive nature, consisting simply of a glass jar, nine and a-half inches wide and twice as deep, filled with hot water and placed on a turn-table, the thermometers being placed in a brass frame within the water. The whole was turned first one way and then reversed, a reading being taken in each position to afford a check. As something like three thousand thermometers passed through the establishment every year, Mr. Galton devised the new apparatus, which consists of a water vessel of stout copper half as large again as the old glass one, and capable of holding forty at a time. This cylindrical vessel has a long slit in it for observing the thermometers as they pass round, and is placed in a wooden case with sawdust packing to prevent radiation of heat, the case also having a corresponding slit for reading. The water is heated by a series of Bunsen burners applied to a coil connected with the vessel at the side. A set of forty thermometers can be read in four minutes.

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NOTES FROM THE NORTH.

Towards the close of my last batch of *Notes* I intimated that the "beer and albumen"—to which our Edinburgh workers had so long adhered and with which much good work had been done—was gradually being displaced by the more popular emulsion process. This is as it should be, because, although the old favourite is capable of giving negatives of the most exquisite delicacy, the emulsion possesses many qualities that, *cœteris paribus*, ought to give it a very decided preference.

At the last outdoor meeting of the Edinburgh Photographic Society there were seven cameras in the field, and with one single exception all were using emulsion plates, the exceptional artist still clinging to beer and albumen, although he, too, has intimated his intention of giving in, thoroughly satisfied from the results of that excursion that equally-perfect negatives may be obtained with much simpler manipulation. I suppose it is but natural that there should be fashion in photography as in other matters, and that, in a limited community at least, the lesser lights should follow the greater luminaries and adopt unquestioningly the process by which the fine results of the latter are obtained.

The emulsion now in almost universal use here is, as I have already hinted, prepared as nearly as possible by the original formula, and corrected so as to leave just the faintest trace of free bromide; but, discarding tannin and all the other substances that have been recommended as preservatives, the washed emulsion plate is treated with simple bitter beer and dried. While the matter was being discussed, a few days ago, one friend urged as an objection the fact that "bitter beer" was an "unknown quantity," whereupon one of the most successful operators in the city replied that theoretically it might be true, and those who preferred theory to practice should use the more definite tannin or other substances; but he wanted the best pictures by the simplest means, and those requirements were fully satisfied by the use of the beer. In practice he just draws as much from the tap as will cover the bottom of the dish in which the plates are to be immersed; and if it be brisk—*i.e.*, rather fully charged with carbonic acid—he adds a little of the Scotchman's panacea for all diseases, good whisky, and feels perfectly certain that each dozen plates will yield a dozen good negatives. In the development a saturated solution of carbonate of ammonia, to which a few drops of an alcoholic solution of pyrogallic acid has been added, is employed, the restraining action of the beer making the addition of a bromide unnecessary. Such a strong developer will bring out a picture that has received a comparatively short exposure, and, as a rule, where the long exposures that are preferred here have been given it should be considerably diluted.

On the whole, judging from what I have seen within the last few weeks, the results of the emulsion process as practised here are clean, crisp negatives, full of delicate detail and beautifully soft and brilliant, and all this with much less labour and more certainty than by any other method of working with which I am acquainted.

Notwithstanding the general diffusion of photographic knowledge, matters occasionally crop up that would seem to indicate a necessity for a little more elementary information being given, either by those who furnish apparatus or those who undertake to give advice and instruction to the would-be photographer, as the following case will show:—

About a year since I was requested to give some practical instruction in the exposure of plates to a gentleman who stated that he had been supplied with a set of apparatus by one of the best makers in the country; that it had been examined by a first-class professional photographer, and pronounced perfect; and that he had by him also been shown how to operate. The requirements of my pupil were moderate enough, being limited to the simple exposure, as the plates were to be supplied ready for the camera and returned to me for development and printing. This simple information was easily given, a stock of beer and albumen and emulsion plates supplied, and thus far all went well.

In due course the emulsion plates were returned with the following information:—"I send you a box of negatives to be printed. Please let me have a copy of each as soon as possible, and if they turn out well send copies also to——." Supposing that he had changed his mind and tried his hand at development, I naturally opened the box, but was disappointed to find that neither backing or unaltered bromide had been removed, and the image, although in full detail, so feeble as to be utterly useless for printing purposes, and that on attempting to produce intensity the whole surface was at once blackened. Subsequent correspondence revealed the fact that the word "negative" had been misapplied, as the idea intended to be conveyed was that the plates had been exposed, and, consequently, that the exposure had been very much too long and the stop used much too large. Instructions as to the remedying of these evils were given, and in due course another batch of exposed plates were received and developed. This time they were the beer and albumen, less likely to be injured by over-exposure, but still only a flat, feeble image could be produced—sharp only for an inch or two in the centre, and ending in clean glass long before it reached the edges of the plate.

This was, of course, discouraging, and more especially so when, in reply to my intimation that the lens was not suited for the work, or that something else was out of joint, he assured me that everything was as it ought to be, as the whole had been supplied by one of the first opticians in London, and examined and pronounced all right by one of the most successful and popular professional photographers in the kingdom. What could a poor teacher and manufacturer of plates say against such testimony? Very little I'm afraid that would have been estimated at much, and so one of three courses was suggested—take the apparatus to the maker, bring it to me, or employ me to go to it. The latter suggestion was adopted, and in compliance with the invitation I last week undertook a railway journey of nearly two hundred miles to correct a mistake that should never have occurred. "It's an ill wind that blows nobody good," and so I enjoyed a delightful three days' holiday, and was well paid for it besides, while my employer is perfectly satisfied with his bargain, which is more than can always be said under similar circumstances.

A very slight examination of the apparatus—or, rather, of the conditions under which it had been used—showed unmistakably wherein the mistake lay. Coming from a well-known firm, I need not say that it proved to be as perfect as wood and brass can be made. It included a *carte* lens, and a landscape combination for plates up to $7\frac{1}{4} \times 4\frac{1}{2}$, the latter of which, on the advice of the aforesaid professional photographer, had been laid aside as of little or no value, and the exposures made with the former with a stop of about an inch and a-half. This, of course, settled both the limited field and the over-exposure, and so, had the distance travelled been short my work would have been done; but, having gone so far, we decided to have a thorough field day on the following day, with a view to make my pupil independent of any aid in development, and to familiarise him with the hitherto-unused lens.

Now there was blame here on somebody's shoulders. It could hardly be the optician's, as he naturally supposed the purchaser would know how to use that which he knew how to order; and, therefore, it must, I fear, be laid on the professional photographer. If so, it is just another illustration of the ills resulting from a too great division of labour. He is only interested in portrait work, and too hastily jumps to the conclusion that all others must be in a similar position, and hence the notion that the combination landscape lens, which probably he had never before seen, was "of little or no use," and might be laid aside.

On the day in question we managed to expose sixteen plates with exposures varying from thirty seconds to ten minutes, but averaging three minutes with the stop marked number three. I am sorry I cannot give its relation to the focal length of the lens. I was under the impression that our best opticians had adopted that system of marking, and think it a pity that they have not. The plates, I may say, for the comfort of those who do not care to prepare their own, were purchased ready prepared, being the "extra rapid" of a well-known firm. They leave little to be desired, developing rapidly and taking intensity readily. They are not, however, all alike. The contents of one box had a film thoroughly adherent to the glass, and permitted of any ordinary washing after fixation, while those of another blistered all over, and required to be handled with much care. With one or two exceptions the blisters have dried down, and although slight markings are visible they do not show at all in the print.

I wonder if anybody still uses rubber solution as a mountant. If so they should see that the solvent is of the right sort. I recently had an opportunity of looking over an album of large, fine prints, many of which had been mounted with the rubber, every one of which was covered with deep-brown stains, while those not so treated were perfectly free from them, and as fresh as when put in. The method now adopted is to paste narrow strips of paper, gummed on both sides, round the edges of the prints, and then to moisten the strip and lay it down on the page of the album. This makes a clean, nice job, there being no mountant to exude and soil the margin, but it would be still better if the print were previously strained on mounted paper in the well-known way and rolled.

Many will remember the fine results that in the days of plain paper printing were obtained on paper salted by immersion in sea water. Here is a hint I have just got from Mr. Gray, whose rapid gelatine emulsion I mentioned some time ago. Everybody is familiar with a marine plant that grows abundantly on rocks uncovered at low water, and has a large quantity of globular bodies filled, especially at this season, with a gelatinous liquid. This, collected and filtered and applied to paper or glass and allowed to dry, will, on being sensitised by the action of silver nitrate, produce a sensitive surface from which valuable results may be obtained. I have been experimenting a little in this direction, and hope to return to the subject; but, meanwhile, I throw out the hint in the hope that others will look into the matter.

My readers will remember that, some time last year, I strongly, on various grounds, recommended the use of wooden dippers, and advised, as a necessary precaution, that they should be soaked in silver solution, coated with paraffine or varnished with shellac previously. This preparation I now find to be unnecessary. Having occasion recently to coat a large plate, and having no dipper long enough and no time to *prepare* one, I hastily made one of a piece of sycamore that was close at hand; and although it has been in pretty constant use, and never out of the solution for a fortnight, the bath is working as well as ever.

JOHN NICOL, Ph.D.

MY STUDIO.

OPERATOR NO. III.

"THE third time's lucky," they say; but after my experiences at starting I had great doubts of any venture proving a success. You will know the story of Robert the Bruce and the spider. Luck or no luck, I had to try again or let the place run to seed.

After a good deal of anxious thought I engaged Tom Graham—a fine young fellow, who turned out a winning card. He was one of those men who, in making their masters' interests their own, find it the best means of advancing their position, wellbeing, and comfort. He was a very delicate lad, and, so as not to let him overwork himself, I had to take as much care of him as he laboured to do of my place. Human nature is a strange commodity! Here, after two blanks, I draw this prize!

This man treated everything under his own care as scrupulously as if it had been his own; and whether I went near the place or not it made no difference to his keeping it always neat and tidy, and the accounts and returns were always up to date and in perfect order. No matter when I went up I never found any idling about—always working, always finding something to do, in his gentle, quiet, unobtrusive way, and always looking cheerful and happy. Now, the other fellows I had had seemed always in a maze. If I chanced to drop in during a shower of rain I could have given odds that I would find them anchored to a chair till it was over, and a dull day was invariably a day of absolute idleness. They did not even make a show of working.

I was charmed with Tom, my place, and my prospects of success. Trade went on steadily increasing, and our work brought a much larger connection round us; for I hold that good work, and nothing but good work, sent out is certainly the best means that the photographer possesses of advertising and enlarging his trade. No slipshod work, every picture first-rate, and the trade will widen and grow. With my extending trade came what was a great grief to me—poor Tom's weakness. He was delicate and consumptive by nature, and he could not stand much fatigue. I got him a special assistant for himself, so that he might have a little rest and get a run to the country now and then; but he did not improve. He was wasting away; everybody could see it but himself. He, poor fellow, was always pulling round, always feeling better; and if you asked him how he felt he would tell you he was quite sure that he would be well shortly if the weather was just more settled. I would sit looking at him when, with his quiet smile, he would talk in this way, and I have thought that it was one of the greatest gifts of Heaven—this halo of hope that lights these poor weak ones to the end. "A false hope," it may be, but you will allow that it makes the little bit of life left to themselves bearable, and, in spite of the weakness, with some little green spots of pleasure in it; when, if you look at the other side, it could be nothing but a black and dreary journey to the grave.

As he grew weaker I did not allow him to work. He would not stay away, but he just walked about and saw the hands at their duties. I believe for very love of the poor fellow any of them would have done anything rather than fret him by carelessness or neglect. A life like his sheds an influence for good all around it.

He wore through two winters and two summers, and the business had progressed and was firmly established; but poor Tom could not stand out the third winter. He worked till within two days of his death. It came to him gently and pleasantly—as sweet sounds floating on the air. He felt that he would never get better. One afternoon, when the snow was lying thick upon the ground, Tom called the hands together and told them that as the weather was so inclement he would stay at home for a few days, and, after bidding them all good-bye, he drove home never to return.

Two days after this, when I was sitting with him, with his hand in mine, poor Tom passed away with a sigh. With that sigh one of my best friends went out of my life.

MURRAY RUSSELL.

PHOTOGRAPHY IN COLOURS.*

To make the double bichromate of potash and ammonia I dissolve in rain water the bicromate of potash, and I add to it liquid ammonia very gradually, constantly agitating the mixture up to a certain moment, when the deep yellow colour of the liquid passes almost in an instant to a much lighter yellow. According to circumstances I vary the strength of this solution from twelve to twenty per cent. As the bichromate of potash uncombined with the ammonia does not dissolve beyond ten per cent. it is by progressive quantities and alternately that I introduce into the water the pulverised bichromate and the ammonia. To be certain that all the bichromate of potash is combined with the ammonia I still add a very small quantity of the latter. The feeble excess is recognised by its slight odour in hot and dry weather. It would be useful to add to the bath some sugar varying from twenty to fifty grammes per litre. I float these papers on the sensitive bath for about five minutes, the time of floating varying with the temperature of the place where operated upon, the gelatine absorbing more liquid in a given time in proportion to the elevation of the temperature.

When the bichromate bath has been very concentrated its desiccation tends to cause crystallisation on the layer of gelatine. This is avoided by heating the stove to its maximum; that is, 25° to 26° C. A higher temperature would cause the gelatine to run.

After drying, and after exposure to light under the *cliché*, the prepared paper is immersed with the layer of gelatine downwards in a basin of cold water, in the bottom of which is previously placed a glass covered with a slight layer of ox-gall. The paper and the glass are lifted out together, the gelatine side of the paper applied against the face of the glass coated with the gall. They drain for a few moments; then the glass being placed on a horizontal surface the excess of water is driven out by the friction of the hand, several sheets of blotting-paper being interposed. Five or ten minutes after this adaptation, the adherence being complete, the glass and paper united are immersed in a horizontal dish of moderately-hot water. The paper soon detaches itself, and the image is apparent adhering to the glass.

The layer of ox-gall may be obtained by spreading upon the glass, like collodion, a filtered solution of eighty parts by volume of alcohol at 40° with sixteen parts of ox-gall. It is dried at the fire.

The red, blue, and yellow monochromes being thus obtained on their three respective glasses, the question is to transport them successively to the same sheet of paper. This is how I proceed:—In a bath of cold water, which is contained in a horizontal dish, I immerse the glass with the yellow monochrome, then a paper strongly gelatined, the gelatine downwards. After imbibing a few minutes, and when the edges of the paper commence to curl, I take out of the water the monochrome on glass and the paper applied thereto. I maintain in contact by the pressure of the finger the edge of the paper, and the corresponding edge of the glass that I have withdrawn first, so that the paper falls of itself on the monochrome gradually. As the whole is taken out of the dish, I let it drain, place it level, and leave the adherence to establish itself alone. This takes place at the end of two or three minutes; then I lightly rub it with blotting-paper interposed, and leave it to dry in a temperature, natural or artificial, of 25° to 30°.

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* Continued from page 238.

When the drying is complete the paper separates itself from the glass, taking with it the yellow monochrome. If this does not occur spontaneously it may be produced by loosening the edges of the paper with a knife, or by slightly warming the glass. To adapt to this yellow monochrome the blue monochrome I immerse in the same basin of cold water the glass carrying the blue monochrome, then the paper carrying the yellow monochrome with the yellow image downwards. After imbibing for a few minutes I take them from the liquid applied the one against the other, conformably to what I have already said.

To effect the coincidence of the outlines of the objects represented on one and the other monochrome I slide the blue on the yellow till the coincidence becomes perfect—an easy operation for him who takes care to notice the traverse of the light in interposing the thickness of the glass between him and the double image given by the glass and the support. (To favour this manipulation take the precaution to cut the gelatine paper a little less than the glass.) The superposition thus established, the adherence of the two monochromes is soon produced. One can then with impunity absorb the excess of humidity by blotting-paper. It is left to dry as before, and the double image separates from the glass.

Following the same method the third and last superposition is made—that of the gelatine paper carrying the double image, the blue and yellow monochrome, with the red one still on the glass, and, lastly, the complete heliochrome will be separated from the glass itself.

The indefinite duration of the proofs may be assured by aluming. Besides, their surface may be varnished with picture varnish, care being taken to dilute the said varnish with spirit.

The gelatine paper, which supports definitely the monochrome, should be strongly gelatinised, so that the reliefs of the three superposed images may be well embedded therein. I employ for that purpose ordinary gelatine, called "blanc-mange." The strength of the solution is 100 grammes to a litre of water. I cover the paper with this liquid at the rate of about twenty-five centimetres cube for a full size photographic glass.

There are exceptional cases where ox-gall fails to give a perfect adherence of the monochrome to the glass during the peeling. This want of adherence may manifest itself by a simple clot, &c. This depends on the nature or degree of the preservation of the gelatine employed in the prepared papers. When similar accidents happen the employment of wax in place of gall is a sure remedy, only this application should be completed by that of collodion, and the operations become more complicated. The glass must first be waxed (the layer of wax is obtained by pouring in places on the glass a solution of wax and ether, which is spread out with a flannel dabber or pad). Secondly, collodionise the prepared paper after exposure to light. With this object the paper is put upon a glass, first raising the edges to form a raised border, and cover it with a layer of normal collodion, five decigrammes of cotton for 100 centimetres cube of collodion. Thirdly, gradually, as each of the three monochromes transferred on the permanent paper support has dried thereon, immerse the image in a vertical tin bath containing ether and alcohol, where the collodion, having become an encumbering substance, dissolves, carrying with it all traces of the wax with which it is covered; these traces would otherwise separate the monochromes the one from the other. Lastly, in place of ox-gall and wax the layer may consist of talc, gum dammar, &c. Many other means may be employed.

The method of printing which has been described applies not only to heliochromes on paper, but also to heliochromes on glass (heliochromic windows). It suffices, after having made the heliochrome on paper, to immerse the proofs in the bath of cold water, to withdraw it attached to a glass previously covered with albumen coagulated with alcohol to let it dry; in that state then to plunge it altogether into warm water, which, by impregnating through the paper, will dissolve the soluble gelatine cover of the former, and consequently detach the paper, leaving the heliochrome adhering to the glass. It need not be said that the proof must not be alumed, and that if the wax and collodion process is used the layer of collodion which covers the third and last monochrome should have been dissolved like the two others before applying the heliochrome to the glass.

It will be understood that this system of superposition of monochromes can be combined with the photoglyptic process (Woodbury process), were it merely by printing the three monochromes formed in gelatinous inks on three provisional paper supports, coated first with a varnish insoluble in water but soluble in alcohol, benzine essences, &c.; for example, gum lac, benzoin, gum dammar, and Canada balsam. After each adaptation of the monochrome to the permanent support the provisional paper support is taken away by dissolving the varnish.

(To be concluded in our next.)

FOREIGN NOTES AND NEWS.

A NEW GOLD SALT FOR THE TONING BATH.—A MOVABLE SCREEN FOR THE GLASS-HOUSE.

IN the course of last winter Herr Neumayer, of Munich, suggested to Dr. Schnauss that he might try how the double bromide of gold and potassium would act as a substitute in the toning bath for the chlorides and bichlorides of gold. Herr Neumayer accordingly prepared a quantity of these salts for this purpose. Theoretically this might have been done by placing thin gold leaf in bromine water and bromine gas, but it was found more convenient to prepare the bromide of gold from hydric bromide and nitric acid, in a similar way to that in which chloride of gold is prepared with *aqua regia*.

In evaporating down the solution of auric bromide—which has a dark-red appearance and smells strongly of bromine—care must be taken not to let the heat act too long or strongly, as the $Au\ Br_3$ is even more easily decomposed than $Au\ Cl_3$. This bromide is scarcely to be had crystallised. If the exact equivalent of potassic bromide, dissolved in a little water, be added to the auric bromide, and the whole evaporated to crystallisation, one easily obtains beautiful garnet-red crystals of the double salt—$K\ Br,\ Au\ Br_3,\ 5\ H_2\ O$. This salt is difficult of solution in water; but a very dilute solution becomes a deep red and effloresces in dry air. Dr. Schnauss tried this double salt, as well as the auric bromide by itself, in combination with various other substances as a toning bath. Its behaviour with the silver prints is similar to that of the compounds with chloride of gold, except that its action is somewhat more energetic and it clears dark prints more easily. The addition of sodic bicarbonate gives a blue-black tone; sodic acetate a purplish tone.

From the *Archiv* we have the following contrivance for the regulation of side lights used in the studio of Messrs. Cramer and Gross, St. Louis:—It consists of a rectangular frame about the size and width of an ordinary background, and running on wheels. Across each division two iron rods are placed, on one of which a white, and on the other a black, curtain is hung. These serve to modify the light as required.

Meetings of Societies.

THE PHOTOGRAPHIC SECTION OF THE AMERICAN INSTITUTE.

PRESSURE on our space has compelled us for a considerable period to leave over reports of meetings of American photographic societies—among them the report we now give.

At the December meeting of this Society, Mr. J. B. Gardner presided. The Secretary read a letter from Mr. J. H. Fitzgibbon, publisher of the *St. Louis Practical Photographer*, offering to furnish the Section with his journal and the use of its columns for the proceedings of the Society, or such articles as they chose to forward.

Mr. H. T. ANTHONY remarked that there should be some provision made to prevent garbled reports of the meetings, assuming to have the sanction of the Section, being published. He alluded to a report of a meeting which was published in the *Photographic Times*, with important matters left out. He wished merely to refer to this subject, so that in future the responsibility of such proceedings should be assumed by the proper parties. There ought to be no report furnished by the Section to any one unless such report was full and explicit; the *onus* for mutilation should fall on those who caused it, and not on the *employé* of the Section.

The CHAIRMAN stated that the Secretary explained the whole matter at a late meeting, at which he presumed Mr. Anthony was not present, or he would see that the Section was in no way responsible for the report alluded to.

The SECRETARY said that at the October meeting of the Section their President, Mr. Newton, exhibited some silvered paper which had been prepared some eighteen months before, and at the time of exhibition was to all appearance in good condition. It might also be remembered that some six years ago he (the Secretary) made some experiments with silver paper, and that on two occasions since that time he had practically tested it and exhibited the results. It occurred to him that day to again look at his silvered paper, and by the date marked on it he found it was prepared on the third day of the third month, 1870—six years and over—and the paper appeared yet white and in good condition.

Dr. MILLER said that the paper which Mr. Newton gave him he had attempted to use without fuming, and found it gave a very weak print indeed; but he remembered that the President's advice was to place at the back of it a pad that had been immersed in a solution of carbonate of ammonia. This he had done, and the paper printed well. He thought it was rather difficult to tone, but still he regarded it as an acquisition.

The CHAIRMAN said that Mr. Newton's process was to silver the paper, and when nearly dry to float it, back down, on a solution of one ounce of hydrochloric acid to forty ounces of water. Now the Secretary's method was to float the paper the albumen side down. In regard to Mr. Newton's mode of preparing paper he would say that he made some experiments in that line, and found that when the paper was floated on the back it required careful handling to prevent it from being wet on the other side. If the paper were in the least way damp the solution would creep over the edges; and hence he inferred that that method would not come into general use for gallery work, but for amateurs and experimentalists, where time could be given, it might possess advantages.

The Secretary remarked that his theory was that, by converting all the silver into a chloride and then rendering it acid, they could thus prevent the paper from changing. But to do that they must change all the free nitrate of silver into a chloride.

Mr. Anthony stated that the main point was to get rid of the free nitrate, and to do that a salt of silver must be formed that does not act on the sizing of the paper. It is the nitrate that acts on the sizing of the paper and changes the colour (even in the dark). He made paper in which the free nitrate was reduced to a minimum degree, and it had kept well at a moderate temperature; but in hot, damp weather it became partially discoloured. It was absolutely necessary to have no nitrate in it. By the word "nitrate" he meant the free nitrate of silver.

Mr. Duchochois remarked that he washed his paper in water and then dipped it in a solution of bicarbonate of soda, and it kept from two to three months; but it did not print as well as freshly-silvered paper.

Mr. Anthony said that some months ago—eighteen or more—a committee was appointed to experiment in regard to the means of removing the hypo. from silver prints after they were fixed by the use of lead and other solutions, as recommended by Mr. Newton and Mr. Anthony. At the time those experiments were made there appeared, from the chemical tests used, to be no hypo. left in the prints. He would suggest that at an early day—say the next meeting—that committee report to them their present condition.

The Chairman remarked that if it was the wish of the Section some of the committee would report and exhibit the prints then made at the next meeting.

On the motion of Dr. Miller the committee was requested to report at the next meeting.

The Secretary said that it would doubtless be gratifying to the members to hear that their President, Mr. Newton, had received the silver medal of the Institute for his prints from emulsion plates exhibited at the late Fair of the Institute.

A lantern exhibition of some exceedingly fine views, taken by Mr. T. C. Roche, at Washington, during last summer, was next given. The collodion used was made with Anthony and Co's new cotton. The views elicited much commendation from the members.

The Secretary remarked that he knew that the members felt deeply grateful to Mr. Anthony, not only for that fine exhibition but for his many other favours to the Section; but he thought the occasion should not pass without some expression on their part that would be recorded on the minutes. Mr. Anthony not only showed what he could do, but was always willing and anxious that others should present their work also. He would, therefore, suggest to the members to bring to the next meeting not only their best work but also their failures, as from them even the members could learn something.

The meeting was then adjourned.

Correspondence.

THE DEVELOPMENT OF COLLODIO-ALBUMEN PLATES.

To the Editors.

Gentlemen,—I am sorry to see that Mr. J. Pollitt considers that collodio-albumen has received unsatisfactory treatment in the paper read by me before the Liverpool Amateur Photographic Association at our last meeting. My regret is augmented by the fact that I am indebted to Mr. Pollitt for many courtesies, and for the trouble he took in 1874, and again last summer, in rendering me *au fait* in the development of these plates. I made no reference to the process as effected by him in my presence, because I was under the impression (and am so still) that the time mentioned in my paper as that requisite for the development of these plates was about the same as that occupied by himself in conducting the operation.

The experiments upon which my remarks were based were performed with the greatest care; my watch was before my eyes as I worked, and I endeavoured to obtain my results with the utmost fairness to each class of plate. I have never tested the precise duration of the development of dry plates before; but from my experience with collodio-albumen I do not think the average time assigned to these plates by me is at all hyperbolical.

I have today developed a negative—exposed in a better light than that referred to in my paper—and I can give the time occupied in the process with the greatest preciseness. The exposure was on a well-lighted subject, in hazy sunlight, at three p.m., with Dallmeyer's 5 × 4 medium-angle rectilinear and smallest stop; time, twelve minutes. Under the alkaline developer the sky line appeared with sufficient force in nine minutes, acid silver brought the negative up to good printing density in twenty-six minutes, and the hypo. accomplished its work in two minutes more. The resulting negative is extremely good, but would bear a little more bringing out in the deep shadows.

I am perfectly ready to admit that, when time and circumstances permit of the daily completion of each day's photographic work, nothing can exceed the usefulness and perfection of these plates. On the other hand, when eight or ten dozen plates must be developed together on the return home from a photographic jaunt, I must confess to a preference for a plate which will admit of far more rapid working. The developers employed by me were as follow:—Four-grain pyro. with occasionally-added drops of a five-grain solution of carbonate of soda; and, for intensifier, six drops per drachm of acetic acid with one drop of twenty-grain silver.—I am, yours, &c., H. J. Palmer, M.A.

May 21, 1877.

KEEPING WET COLLODION PLATES SENSITIVE.—FLOWING BICHROMATISED SOLUTIONS UPON GLASS.—SENDING PRINTS BY POST.

To the Editors.

Gentlemen,—Seeing remarks made in the journals occasionally about the difficulty of keeping collodion plates after sensitising, I thought you might be interested to know that the difficulty may be overcome.

During the taking of exhibits at the Centennial exhibition it was found necessary to give, in many cases, long exposures; and as the dark room at the studio (which is some distance from the exhibition building) was the base of operations, especially for large work, it became a necessity to provide some way of overcoming the difficulties usually met with. This was, happily, accomplished by Mr. G. Ennies, who had the charge of the chemicals in the dark room. He compounded a collodion which, with ordinary treatment, could be kept five hours after sensitising. By this mail I send you a print the negative from which it was made being developed three hours after sensitising. Taking into account the various difficulties in the way—the erecting of screens to shut off light and to use as reflectors, and especially the trouble of strong light coming through the glass sides of the building, as you see shown over the top of the case—I think you will say it is a good specimen of photography.

Some time ago a writer in your Journal remarked on the difficulty of flowing a plate with bichromatised solution for the powder process. I get over the difficulty by pouring the solution on the top of the plate, and then breathing on the plate when you wish the solution to flow. If done steadily and without hurry there is no more difficulty than with collodion.

In sending unmounted prints by mail, or in packing them away, allow me to suggest that they be rolled with the albumen *outside*, not inside, as I see some one advises. This lessens the danger of cracking the albumen, and allows the print to lie flat when unrolled.—I am, yours, &c.,

Philadelphia, May 8, 1877. H. C. Bridle,
Supt. Printing Dept., C. P. C.

[The print which accompanied the above letter is an admirable one, and testifies to the skill with which the negative was produced. We shall be much pleased to hear further from our correspondent concerning the photographic work done during the Centennial exhibition; and, if it were possible, we should also like to receive some information as to the modification introduced by Mr. Ennies, whereby the plates are made to keep so well.—Eds.]

CARBON POISONING.

To the Editors.

Gentlemen,—The manipulations connected with the photographic art have, like many of those in other branches of industry, always been carried out with the aid of poisons.

When after the year 1839 the newly-discovered daguerreotype, like a plague, flew over the earth, it was attended with the fumes of iodine and bromine—very dangerous to life and health; but no voice was raised against it, and if it had it would have been without the least effect.

After this, about 1850, the pictures on collodionised glass came into vogue, which demanded the use of cyanide of potassium and chloride of mercury—both, as we all know, highly deleterious materials; but no objection was made against their use. "Pictures! pictures!" was the sole cry.

Carbon printing has now entered the arena, claiming its right to preference. Its chief agent is the bichromate of potash, and this salt has generally been considered as quite innocuous, until now, when we are taught to believe the contrary.

However, the danger should not be placed higher than it deserves, and not be considered greater than the perils under which photographers have hitherto worked—not even so dangerous. The operator has only to protect his fingers, not to splash in the sensitising bath as if it were clean water, and not to omit careful washing after having touched the solution.

Operators with thin-skinned hands ought not to touch the solution, but should manipulate the tissue with wooden sticks or pincers of horn; and, having previously rubbed the finger-ends with a bit of tallow, they may use them for hanging up the paper to dry. The tallow will protect the skin, and leave the fingers clean and uninjured when subsequently washed with soap. By this simple mode of procedure all danger of poisoning is avoided.—I am, yours, &c.,

Copenhagen, May 16, 1877. PETER CHR. KOCH.

◆

WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.

To the EDITORS.

GENTLEMEN,—Allow me to correct the statement of "Free Lance" in your Journal of this week.

Mr. Wormald never said anything about "pigmented artists." What he said, and what I wrote in the report I sent to you, was that he (Mr. Wormald) was of opinion that, with regard to artistic feeling in photographs, some of the portraits by our best photographers were equally as good in light and shadow as the works of some of our *best* artists, and *not* "pigmented artists" as you have it.—I am, yours, &c.,

34, *Albert-road, Saltaire, May* 21, 1877. R. NEWSOME, *Hon. Sec.*

◆

EXCHANGE COLUMN.

Lantern and dissolving view apparatus or slides will be exchanged for good posing chair or gallery fittings.—Address, 43, Princess-road, Birmingham.

Shepherd's portrait lens, with diaphragms for cabinets and whole plates, will be exchanged for rapid doublet covering 12 × 10, or whole-plate bellows camera with double dark slides.—Address, S. S. CREWDSON, Photographer, Ulverston.

◆

ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

NOTICE.—Each correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a *nom de plume* as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

EDINBURGHER.—Yes, most decidedly.

S. H.—The date you have given in your letter is incorrect. It will not, however, be expedient for us to investigate the matter farther.

W. WHITE.—The gentleman named disappeared from public life several months ago. So far as we are aware he is still alive and well.

C. H. LLOYD.—Desiccate the albumen before you leave this country. It can be dissolved, when required, in water containing a trace of ammonia.

GEORGE FREEMANTLE.—Albumenise the paper by floating it upon albumen salted with chloride of ammonium in the proportion of six grains to the ounce.

J. D.—1. The terms are said to be £40, but particulars will be duly announced.—2. No information is accessible beyond that which we have published.—3. See the account of the experiments we have made in this direction.

GEOGRAPHICUS.—The book to which you probably allude is one entitled *A Peep at Mexico*, which was published about three years ago by Trübner and Co. It is the only work on Mexico illustrated by photography of which we are aware.

J. H. P.—In addition to the methods already published in this Journal you may also try the effect of dabbing the glass with a putty composed to a large extent of white lead. The most convenient method of applying it to the glass is by rolling it over the surface.

A BEGINNER.—You must give the back of the plates a coating of any red or brown coloured varnish that is soluble in water, and there will be no further cause of complaint. A mixture of Spanish brown, *weak* gum water, and glycerine applied with a sponge will answer every purpose.

ARGENT.—There is no fabric so good for a portable tent cover as mackintosh cloth. It must be carefully selected, so as to ensure its being free from pinholes. If after it has been constructed such pinholes are found, paint them over with a little masticated rubber containing some opaque pigment.

J. H. ADAMS.—Obtain some of Bates's black varnish, which is sold by all dealers, and incorporate with it as much lampblack as will cause it to dry without gloss. If any difficulty be experienced in obtaining the varnish named recourse may be had to Brunswick black, which will answer the purpose nearly as well.

P. C. M.—The collodion emulsion certainly flows very smoothly over the plate, but this is its chief virtue. We tried a plate, following the directions you gave, and after an exposure of far longer duration than we usually give such plates we failed entirely to develope any image except that of an indication of the sky. Do not, however, be discouraged by this report; but make another sample of emulsion, and increase the proportion of the nitrate of silver.

ROBT. WILSON.—Try the effect of adding about two or three drops of creosote to the gelatine. It might, perhaps, be advantageous to divide the gelatine emulsion into three parts—to one adding creosote or carbolic acid; to the second part adding oil of cloves; alcohol being added to the third. By preparing plates with each of these at definite periods of time, after mixing, a good idea would be obtained of the preservative effect of each of these antiseptics upon the emulsion, and it would also be ascertained to what extent they impaired the sensitiveness.

MEDICUS.—1. Nitrate of soda will not precipitate the silver; hence we conclude that the nitrate must have been adulterated with either the chloride or some other salt which causes a precipitate.—2. If you call at our Publishing Office when you are next in town you will have an opportunity of seeing several choice examples of the photochromic works of M. Leon Vidal. You can also see specimens executed by Willis's platinum printing process.

PROCTOR.—It would be better that you should obtain a copy of our ALMANAC for 1873, which, although out of print, might, perhaps, yet be procurable at some of the photographic warehouses. In that volume is to be found a progressive series of lessons in photography of the very kind you desire, the practical part being separated from the theoretical. The text of each chapter contains the practical directions, and this is followed by such explanatory notes as are considered necessary.

H. S. R.—The solution of tannin will require no treatment beyond very careful filtration; but by no amount of care in the filtration will you obtain the bright, sparkling solution of gelatine that is necessary for your purpose. This is secured in the following manner:—Having dissolved the gelatine, mix with it very intimately the white of an egg which has been previously beaten up in a cup. When mixing, see that the gelatine is heated to a no higher degree of temperature than suffices to retain it in a fluid condition, and after the two solutions have been well incorporated raise the temperature to such a degree as will effect the coagulation of the albumen, which must then be removed by filtration through muslin. The resulting gelatine will be very limpid.

REV. G. H. R.—It is quite true that the usual position of the posterior crown glass lens of a portrait combination is that of having the most convex surface to the front—indeed so true is it that it may be accepted as the rule; but to this rule there is an exception in the case of certain of the lenses constructed many years ago by an eminent optician now deceased, who reversed the position of the posterior crown, and thus obtained, with shallower curves, the amount of negative aberration requisite to give good marginal definition. But the field given by such lenses was not flat, if we judge by one, of about twelve inches focus, in our possession; however, for excellence of marginal definition we have never seen anything to surpass it. The value of a lens of this kind consists in its adaptability for taking sitting figures without the employment of a diaphragm being necessary.

◆

TRADE CATALOGUE.—We have received from Mr. P. Piquepé the new edition of the trade catalogue of the Photo. Artists' Company, which is illustrated by two portraits from one negative, these being respectively before and after retouching. The improvement effected by the retouching is of a very marked character.

PHOTOGRAPHIC PRESENTATION TO HER MAJESTY.—The Lord Provost and Water Trustees of Glasgow have just had completed a very handsome and beautiful photographic album of the Loch Katrine Waterworks, for presentation to Her Majesty, who opened that extensive water system. The album contains twenty-eight views of the more important features of the scenery along the route of the waterworks from Loch Katrine to the city.

ROYAL CORNWALL POLYTECHNIC SOCIETY.—It is a little unfortunate that the annual reports of this excellent institute are not issued until after the annual general meeting, which is held long after the exhibition is closed—indeed while preparations are doubtless being made for the subsequent exhibition. Under these circumstances the jurors' report upon the photographs displayed last September has now become *passé*. The photographic judges, we learn from the forty-fourth annual report, just published, were Messrs. R. Fox, H. Cox, and T. Hart. The exhibition, as a whole, seems to have been highly successful.

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METEOROLOGICAL REPORT.

Observations taken at 406, Strand, by J. H. STEWARD, Optician.

For two Weeks ending May 23, 1877.

THESE OBSERVATIONS ARE TAKEN AT 8.30 A.M.

May.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks.
10	29·59	W	49	54	64	48	Cloudy
11	29·52	WSW	49	50	59	47	Raining
12	29·57	SE	49	51	56	45	Dull
14	29·66	E	48	50	57	46	Dull
15	29·81	W	51	53	64	49	Dull
16	30·12	SW	49	52	61	44	Cloudy
17	29·90	S	51	53	58	50	Raining
18	39·98	W	51	56	64	46	Fine
19	29·87	W	50	53	57	48	Raining
21	30·19	NE	47	50	57	46	Cloudy
22	30·22	NE	46	48	52	44	Raining
23	30·24	E	42	46	52	41	Cloudy

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 891. Vol. XXIV.—JUNE 1, 1877.

ON INTENSIFICATION BY MEANS OF LEAD.

This method of intensification, introduced during last year by Herr Eder and Captain Tóth, is intended solely for use in connection with subjects devoid of half-tone, such as reproductions of line work, and has secured a considerable amount of favour upon the continent, where that class of work is more generally practised than in this country. We have had occasion to allude to the process more than once, and, though comparatively seldom used, it is of the greatest importance to have at hand and ready for use on an emergency an efficient and reliable means of securing the somewhat exceptional class of density requisite in the reproduction of engravings or other subjects without natural half-tone; hence we jot down for the benefit of our readers the following remarks upon this newest of methods.

Though, as we have remarked, the necessity for this class of work is of comparatively rare occurrence, except in special establishments, it is by no means easy to carry out to a successful issue without a little practice and a due consideration of the points in which it differs from ordinary portrait or landscape work. The requirements of the latter descriptions of work have been sufficiently discussed in recent numbers of this Journal; and we need therefore only point out that the main difference in line reproduction consists in the necessity for extreme density of the whites, even to complete opacity, combined with perfect transparency in the lines composing the picture, either of which conditions is easily secured singly, the difficulty resting in the combination.

Of the various methods of intensification adapted to, or used for, this purpose the first we may notice is the ordinary acid silver process; but this, whether the intensification be performed before or after fixing, is objectionable on the ground that a developing as well as intensifying action proceed simultaneously, the effect of which is that, though any desired depth of deposit can be obtained, the blacks are invariably fogged or covered with an abnormal deposit of silver, which detracts not only from the beauty but also the printing qualities of the negative, and greatly increases the time required in printing. The recognition of this defect has led to the adoption of various forms of purely chemical intensification, based upon the formation of a thin, clear, silver image, which is strengthened by the conversion of its silver by chemical means into a more non-actinic state. The more generally known of this class are the various methods in which bichloride of mercury forms the active agent, and also the Schlippe's salt process of Mr. M. Carey Lea. The only objection to the use of the latter appears to be the difficulty which is experienced in procuring the Schlippe's salt; but, with regard to the methods involving the use of mercurial salts, it is well known that an ill reputation is attached to them. Though undoubtedly effective in producing considerable density, the result is of so changeable a character as to be perfectly untrustworthy, except in cases where but a few prints are required to be taken from the negative. In addition it may be noticed that these and similar methods require the formation of a tolerably strong silver image to start with; for, as they add no material to the deposit already existing, but only change its character, it is obviously necessary that there should be a sufficiency of original matter to work upon. It follows that the more we have to push the silver intensification the greater risk there will be of fogging the image.

The process of intensification with nitrate of lead and ferrocyanide of potassium appears to be free from these objections. It is purely chemical, and can, therefore, produce no deposit where such does not previously exist; hence there is no danger of closing up the fine lines. The deposit formed by treating the lead picture with sulphide of ammonium appears to offer every chance of permanence, and, owing to the fact that fresh matter is added chemically to the image already existent, the effect is not entirely due to mere change of colour; thus very great density may be obtained from images originally extremely weak, and, if desired, the added matter, ferrocyanide of lead, may be replaced by its equivalent of the silver salt, and thus any doubt on the score of the permanency of the lead picture is removed by the production of an image in silver alone. Such being the advantages accruing from this method, let us now turn to the working formulæ.

We commence with a solution composed of—

Nitrate of lead	20 grains.
Ferricyanide of potassium	30 ,,
Water	1 ounce.

The two salts are dissolved separately and filtered before mixing, the resulting solution being of a deep lemon-yellow. Into this mixture the plate, previously well washed, is plunged until thoroughly bleached, when it is again washed very freely. It may be here noted that the success of the operation is largely dependent upon the complete removal of the solutions from the pores of the film at the various stages of the process, as a very slight trace allowed to remain will prove sufficient to produce a veil over the whole surface, or, in worse cases, to develope unsightly and irremediable stains. If the plate be immersed in the lead bath immediately after development, and before it has had time to dry, the action of the solution will be complete in a few seconds; but, if the film have been allowed to dry before it is operated upon, the action will be slow and irregular, owing to the impermeability of the collodion. In such cases it is well to soak the plate for some minutes in ordinary methylated spirit previous to submitting it to the lead solution. Methylated spirit appears to possess greater penetrating power than pure alcohol.

After removal from the lead bath the film should be of an uniform, white appearance by reflected light, but when looked through it shows considerable density and opacity. In this state it is, in fact, quite dense enough for most printing purposes; but the character of the deposit is not of a sufficiently stable nature to warrant its use in that state. It is necessary, therefore, to treat the image—which now consists of a mixture of ferricyanides of silver and lead—with some reagent which will convert it into less changeable material. A great variety of substances may be used for this purpose, the best of which is sulphide of ammonium, which reduces the two metals to the state of sulphides. The image thus formed is of a dense brownish black colour of great power in arresting the light. We have also obtained very good results with solution of bichromate of potash, which gives an image of a bright orange colour of great actinic opacity. To many, however, this colour will no doubt be objectionable, though it is, of course, a matter of taste.

In consequence of the very great accession of strength which this mode of intensification gives, the very faintest tints in the original negative acquire under its action considerable density, and what appears at the commencement of the operation perfectly clear glass may possibly have a sufficiently thick—though to the eye scarcely appreciable—layer of silver to produce a decided veil when intensified. Hence it is of the highest importance that the lines in the original negative be represented by *really* clear glass. As this is at times a matter of some difficulty to secure without special precautions, it is necessary to adopt some method of removing any traces of incipient fog—an operation which is more conveniently performed before commencing to intensify than at any subsequent stage. For this purpose it is only necessary to treat the image after fixing with a weak solution of iodine, or, better still, chloride of copper, followed by a second application of the fixing solution, which should consist of hyposulphite of soda in preference to cyanide.

The *modus operandi* of this part of the process will be sufficiently understood by most of our readers without any further explanation from us; but it may be as well to warn them against the use of too strong a solution of either iodine or cupric chloride. The stronger these solutions are the greater danger will there be of obliterating the finer lines of the picture, as also of irregular action. It is much better, though it occupies a little more time, to clear the picture by repeated applications of the iodine and hypo. solutions than to do it in one operation, as we are thus able to judge to a nicety exactly how far to go, whereas the appearance of the image under the action of the iodine is liable to prove deceptive. The iodine solution is made by adding a few drops of the tincture to water until the latter acquires the colour of very pale sherry; if chloride of copper be preferred a few drops of a strong solution, diluted until the colour is only faintly perceptible, will be found sufficiently strong. We may add, as a further precaution against irregularity of action, that the picture should be immersed in the solution in preference to pouring the latter on to the plate.

In spite of all the care it is possible to give in the above matters there are one or two other difficulties which may possibly present themselves, and which we briefly noticed last week. These we have since been able to trace to their source. First of all, the transparent portions of the negative are covered with a slight veil; this may be caused by the presence of a very faint trace of incipient fog before intensification as noticed above, or, more probably, by imperfect washing between the various operations. Careful and thorough washing is of the utmost importance in this process; and it will be found a safe plan, after washing for some time under a stream of water, to allow the plate to soak for some minutes in a dish.

The second difficulty which presents itself consists of a coarse, granular appearance of the deposit, the film in bad cases having a dusty look, as if the matter forming the image were on the surface rather than in the collodion. This may arise from an unsuitable collodion or from its being over-iodised. The pyroxyline employed should be of such a character as to give a strong, somewhat horny, film capable of holding together the dense image formed by the lead solution. The collodion should be only moderately iodised, or the film will contain such a quantity of silver that, when subjected to the action of the lead bath, the newly-added matter will burst out of the pores of the collodion and cling to the surface in coarse particles. It is, doubtless, owing to the character of the pyroxyline used as well as the large proportions of silver they contain which renders the action of this method unsatisfactory upon emulsion films.

Next we come to the slow and irregular action of the lead solution upon the picture; but when this trouble is met with it will be almost invariably in connection with a plate which has been permitted to dry before intensification. The remedy has been noticed previously; but if the soaking in alcohol prove ineffective, or if the plate should not have been dried, the inference is that the collodion is at fault. To the same cause we must charge the splitting of the film upon drying which is occasionally met with when using ordinary collodion, and almost invariably with emulsion plates. The extra strain put upon it by the introduction of a considerable amount of foreign matter as well as the numerous and continued washings prove too much for the strength of the collodion, and the contraction which ensues upon drying rends it into fragments. The only remedies which can be applied in palliation of this defect consist in the use of a substratum of albumen or the application of a solution of that substance to the film immediately previous to drying. Even these, however, are not always effective.

In conclusion: we may repeat that this mode of intensification is likely to prove most useful in the production of the special class of work for which it is intended; and, though at present surrounded by a little uncertainty, is likely, when better understood, to come into pretty general use. It has the advantage of being inexpensive, and, beyond the exercise of a little care, presents no particular difficulties of manipulation.

A NEW RESIN—KAURI GUM.

We have recently met with a new vegetable product of peculiar origin and properties, the classification of which for some time was very puzzling until we made the acquaintance of a gentleman who was quite conversant with its appearance and sources. He at once pronounced it to be "kauri gum," which is exported in some quantity from New Zealand.

The physical properties of the gum were so different from those of most resins that we were led to try some experiments with it, which, though not entirely encouraging, may be here given to serve as a guide for those who choose to essay further trials of its usefulness from a photographic point of view.

In appearance it is most like amber, which, also, in many other respects, it resembles. It is very similar to it in colour or, one may say, colours, for it is found in all the hues of amber, from pale straw to light brown, and mingled also with cloudy-looking masses like clouded amber. It breaks with a lustrous fracture in the same manner as amber, but it is not so tough, and is consequently more fragile. Like amber, also, it is in a manner allied to fossil products; for, instead of being collected from growing trees, it is dug out of the ground on the site of old forests long laid low, and almost even with the ground—almost, but not quite, even; for to the little inequality on the surface of the broad, open ground, where the giant trees have fallen, does the gum hunter owe the power to find the hidden treasures of kauri gum.

It is supposed that, possibly many centuries ago, conflagration of the Ti tree scrub had destroyed the gum-bearing trees, which fell where they stood, half-incrusted with the hardened sap, and according to their condition yielding small flakes or huge masses of sap, as the heated ground around them caused every particle of the resin to come to the surface. To find the gum, the heaps or mounds alluded to—which are covered with long grass and often scarcely discernible—are pierced by a steel-tipped spear which is carried for the purpose. A little practice soon enables the gum digger to discover if he has struck, not "ile," but gum. The experienced man then soon bares the spot, and finds pieces of the amber-looking material in blocks of various sizes, from a few ounces to half a hundred weight.

This digging, which affords a means of livelihood to a large number of natives and colonists, known as "gum diggers," is also undertaken by the sheep breeder in his leisure moments, and to the small holder often, if luck favour him, forms a not unwelcome increase of income. It is collected and sent to market for shipment, and in England it appears to find purchasers who use it for the purpose of dressing calicoes with, for which object it is possibly dissolved by the aid of alkalies.

To return to the physical properties of the material. In its peculiarities of solution it acted more like copal; like that gum it is difficultly soluble, and further experiment may show still further likeness. One remarkable characteristic of copal is its power of becoming more soluble in alcohol after first melting it with as little heat as possible, when, upon resolidification, it is found much more easily soluble. We have not yet tried whether the kauri would act in a similar manner, but shall do so shortly. So far we have tried its solubility in alcohol, chloroform, benzole, and turpentine.

In alcohol it is quite insoluble after a week's digestion, a little colouring matter only being taken up.

In chloroform it is soluble to a great extent, a small proportion, after repeated shakings during the course of a week's digestion, appearing to refuse to dissolve.

In benzole it is partially soluble, though not nearly to the extent of the chloroform solution.

In turpentine its solubility appears to lie between benzole and chloroform.

In all the three last cases a portion only of the gum dissolves, leading to the supposition that it may be composed of a series of different and distinct resins having preferential solubility in the various menstrua. Upon trying the varnishes thus produced upon negatives they all gave a beautiful glossy film, not easily scratched through so as to reach the glass, but very easily rubbed upon the surface, as though something of the nature of beeswax might be contained in the substance dissolved. The varnish with turpentine had a decided advantage over the others in tenacity.

Up to this point they are all, therefore, decidedly inferior to shellac as a photographic protective varnish; but further experiments are well worth trying, seeing this new substance can be bought at under one shilling a pound, while good shellac costs about three times the price. It is possible that treatment with an alkali may take from the kauri gum that principle which causes the surface gloss of the varnish to be so destructible.

We may conclude our notice of this very interesting product by stating that all three of the varnishes give most excellent surfaces for retouching upon with blacklead; indeed, we have met with no varnish superior to them for the purpose.

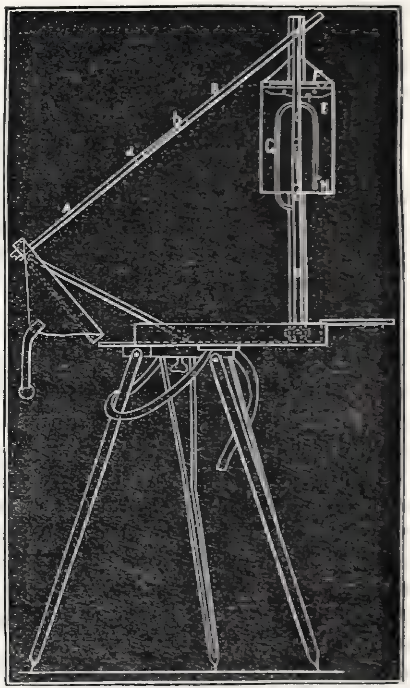
AN "IMPROVED" PORTABLE PHOTOGRAPHIC APPARATUS.

We frequently experience much difficulty in giving descriptions of foreign specifications of patents, because of the niceties inherent in conveying by means of a translation the precise phases of meaning intended by the inventor, such meaning being too often marred in the course of the transition it necessarily undergoes between its enunciation (not always very clear) by the patentee in his native language and its presentation in the form required in a specification printed in our own vernacular. Thus, in translating from a translation the lingual difficulty to be encountered, if not successfully overcome, is sometimes one of no small importance. We are aware of one case in which, after spending two days (part of which time we were ably assisted by an international patent expert) in grasping the ideas and in writing an article in which we endeavoured to explain the imperfectly-rendered English of a Parisian patentee, we were for our pains merely apprised of the fact that we had made an egregious failure and had ruined the prospects of the patentee—at least within the wide radius of the circulation of this Journal.

The specification of the patent we take the opportunity of presenting to our readers is one the precise nature of which we confess our inability to thoroughly understand. At first sight it appears to be the idea of a man who has not taken the slightest pains or trouble to keep himself informed of what has been done, or what is being done, in the particular department in which he has allowed play to his inventive faculties. We, of course, do not attribute the slightest amount of blame to M. Jules Alphonse Terpereau, of Bordeaux, for not being well informed, either as to what has been done in the way of photographic tent-making in that little world of ours into which he has carried his special invention, or as to the law by which it is enjoined that in order to the validity of a patent invention it must be described in a manner to be "workable" from such description by any ordinary skilled workman. It may be that the inventor is dependent for his knowledge of "what's what" in photography upon some of the journals published in his own country, and which do not seem even to pretend to cast a penetrating glance to any distance beyond what in Scottish vernacular is designated as their "ain ingle neuk."

The latest published patent specification has as its title *Portable Photographic Apparatus*; and although, in the preamble, it is said to "relate to a portable camera obscura for tourists and photographers," we have been not a little puzzled to discover in it any element whatever usually associated with a camera. It is very possible that if we had the inventor at our side while we write he would at once enable us to comprehend and, perhaps, appreciate the invention for which he has obtained the protection of letters patent; but in his absence we have nothing on which to fall back but the specification.

We infer, from a perusal of this specification, that what has been named a "portable camera obscura," or "portable photographic apparatus," is not a camera at all according to our acceptation of that word, but is really a dark tent or developing-box. Accepting this inference, we must inquire in what respect this new operating chamber of French invention differs from, or is superior to, those which for so many years have been familiar to every English landscape photographer. The specification (which is illustrated by a diagram) is as follows:—

> This invention relates to a portable camera obscura for tourists and photographers.
>
> The principle upon which this invention is based is in the arrangement of the box, which, small as it is, opens to a size sufficient for forming a darkened chamber or camera obscura suitable for taking any kind of photograph, scenery, or portrait on plates up to 10½ inches (27 centimetres).
>
> The accompanying sheet of drawings shows a portable photographic apparatus embodying this invention set up ready for operating.
>
> 
>
> Upon the sides of this box is nailed or otherwise fastened a curtain composed of three pieces or panels forming the chamber. In one of the panels is the window, but instead of being of glass it is of glazed linen or other similar material. The curtain forming the chamber is cut of a shape to permit the immediate closing of the camera obscura and the photographer to operate without fear of the wind interfering with the operation. These curtains are held (and this constitutes the second part of this invention) by an arrangement of rods in two parts, A B, C D, at each end of which are two pieces of tin or other suitable material, *a b*, *c d*, into which enter each end of the rod or stick.
>
> A certain quantity of water is required for photographic operations, and instead of a metal bottle a pocket E is provided in the form of an india-rubber bag, at the top of which is a funnel F, through which the water is introduced, and an india-rubber pipe G, for letting out the water required, and, finally, in order that it may not run out except when required there is fitted at the end of this pipe a hermetically-closing, self-acting stopper H. When operating, this little receiver is hooked on to one of the uprights in such a manner that the water may come directly into the basin placed in the middle of the camera obscura.
>
> It will be readily seen that this invention provides an apparatus suitable for all kinds of photography enclosed in a very small space, because the setting-up rods separate and the sides fold into the box, which is very portable either in the hand or like a knapsack.
>
> This portable photographic apparatus rests upon a tripod, like ordinary portable photographic apparatus.
>
> Having now described and ascertained the nature of the invention communicated to me as aforesaid, and in what manner the same is or may be performed, I claim (says the patentee) as secured to me by the hereinbefore in part recited letters patent, the shape and arrangement of the box forming the base of the camera obscura, together with the arrangement of the setting-up rods or sticks and that of the curtains which serve to close the dark chamber, the whole substantially as hereinbefore described and shown on the accompanying sheet of drawings.

Very numerous indeed are the varieties of tents and developing-boxes which have been invented and described in this country. The *genus* may be represented as consisting of a flat portable box, which opens and displays struts which, when distended, form supports for a light-proof covering. Some of these permit the photographer to have his head and part of his body inside; others again necessitate his examining what is to be seen in the interior through a window in the covering material, his arms obtaining access to the inside through light-proof sleeves at the sides. The general principles upon which the photographic tent or developing-box has been constructed are, and have long been, familiarly known; the only room for the exercise of the inventive faculty is, therefore, confined to the arrangement or modification of matters of detail.

Having regard to the patented invention before us the question arises—Has it in any way advanced our knowledge of what may be designated "tent conditions?" We emphatically answer in the negative. A yellow window "glazed" with yellow calico or any other flexible material has been one of the recognised conditions of tent construction for over a score of years in England. A portable box having an opaque body of flexible material nailed to its sides is the basis of the majority of our developing-boxes; an india-rubber bag for containing water instead of a rigid metal bottle has for many years been an established item of demand which has been responded to in commerce; a covering which will both shut out light and wind and also include the photographer is, so far from being a novelty, a subject upon which the executive skill of the engraver has been expended for far more than a dozen years in illustrating in an adequate manner the catalogues of the enterprising dealers in photographic materials in the metropolis and in every large provincial city and town.

Upon the subject of a definite claim having been made by the patentee for an opaque curtain or cover for his dark chamber, together with the rods and sticks which support this cover, we shall not trust ourselves at present to make any remark. It may be that if we are ever privileged to see one of the results of the invention in question we may find some points of more value and novelty than those which appear in the specified account; but, in the meantime, and from the data presented to us, we must confess our inability to appreciate either the novelty or utility which, we have no doubt, the patentee has perceived in the fruits of his invention.

Now that the outdoor season has opened in earnest, and while cameras are being dusted out, lenses polished, and attention generally turned to the all-important preparations for the photographic campaign, it behoves us to give a little thought to those minor additions to our outdoor "traps" which contribute in no small degree to the comfort of our operations. Amongst these luxuries we may reckon the view-meter, which, though not an absolute necessity, saves much time and trouble in selecting the best point of view, and enables us, without unpacking the camera, to tell at a glance whether a subject comes within range of the powers of our lenses, or is likely to be worth an exposure. Many forms of view-meter have been recommended, but the most simple, portable, and inexpensive one we have seen, and which may be constructed by any ordinary amateur, may be thus described:—Provide two (or more, if preferred) short lengths of brass tube, sliding one inside the other in telescope fashion; if brass tube be not obtainable, thin cardboard or three or four thicknesses of paper will answer equally well. The exact size is immaterial, as the requisite angle of view is regulated by drawing out the tubes so as to vary the distance between the eye and the screen. Into one end solder or otherwise fix a plain diaphragm perforated with a central aperture to form the eyepiece, and in the other a diaphragm or screen the opening of which is of the exact proportions (not size) of the plates used, and the instrument is complete. Ascertain by actual trial how far the tubes have to be drawn out in order to render visible through the square opening the same amount of subject as is depicted upon the focussing-glass by a lens of given focus, and make a mark at the proper point. The adjustment, once obtained, is always correct, and may be repeated for each different lens used for that size of plate. We thus obtain at the cost of a few pence an instrument which enables us to tell at a glance how a view will "compose" upon the plate, the most suitable focus to employ, or the best point of view from which to operate, without the trouble of unpacking and fixing the camera or changing the lenses. When not in use it will pack comfortably in the pocket or in any odd corner amongst the rest of the apparatus.

STRAY THOUGHTS ON CARBON PRINTING.

[A communication to the West Riding of Yorkshire Photographic Society.]

In bringing before you this evening a few stray thoughts on carbon, or pigment printing, I may say, at the outset, that I do not bring them in the expectation that they will carry with them the weight and importance they otherwise would supposing they were uttered by a more able and experienced person in our art-science. But I simply place them before you as the result of my own thought, reading, and observation upon the subject.

In relation to the birth, rise, and progress of pigment printing it is not my purpose this evening to say anything, except that, like numerous other very important inventions, it has had many struggles for existence during its career from the cradle to its present state of maturity.

Upon the nature of the chemical changes which take place I need not dwell, as these have often been explained in the journals and other publications, and formulæ, manipulations, and practical details frequently given. But there are points upon which there seems to be a considerable difference of opinion and practice. A few of these I will mention.

1. *The Tissue.*—Some affirm that it is not always of uniformly good quality, and therefore they cannot get uniformly good results; others say the fault is not in the tissue but in the operator, the tissue being always good and reliable. Again: the Autotype Company claim to have the sole right to make and sell the pigmented paper, while some persons affirm that anyone has a right to make it for himself. Some say that the tissue sold by the Autotype Company to licencees and to those who have no license is all alike, but the Company deny the charge. These matters of difference, I presume, we shall not be able to settle here tonight, but shall have to leave them for settlement by actual experiment or by some legal tribunal, as the case may be.

2. *The Sensitising Bath.*—Upon the strength or percentage of bichromate salt to be used various opinions are held. To take a few: Mr. John Milner [see THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, 1877, p. 73], after stating some of his difficulties, says:—"The result was the adoption of a one and a-quarter per cent. bath for all carbon work, large or small—prints up to 20 × 16 leaving nothing to be desired so far as the strength of sensitiser was concerned." The Autotype Company give strengths of five, four, and three and a-half per cent., while some others give as high as seven per cent. As to the composition of the bath: some advise the use of bichromate of potash simply; others, the same with a few drops of liquid ammonia added until a pale yellow colour is produced. Some advise a mixture of the two salts, bichromate of potash and ammonia. Mr. R. Jastrzambski gives bichromate of potash 4 parts, carbonate of soda 1 part, and water 100 parts. One class recommend the addition of alcohol to the bath, M. Charente going as far as forty per cent. Another class of persons say that, after sensitising, the tissue should be passed into a bath of alcohol.

Again: if we advance a step further we meet with the same difference of opinion with respect to the time of immersion. Some operators have advised a very short immersion—only six seconds—while some others advise as much as three minutes. Some draw the tissue out of the bath over a glass rod in order to take away part of the bichromate solution; others advise that it should be placed, face down, on glass, and take away the excess by the use of the squeegee, then strip off from the glass, and suspend to dry; while some prefer drying on the glass, and claim the double advantage of smoothness of surface to lay on the negative and better keeping qualities.

As to drying, we have various methods. By one the tissue is placed with its back on a piece of blotting-paper, over a stick or rod, allowing the ends to slope from the middle. A second will hang up the tissue in an open room by means of clips—by preference near an open chimney. A third will dry in a closed box, through which a current of cold air is made to pass. A fourth will employ a gentle heat, and so on. Again: it is stated that the drying must be done slowly, and thereby obtain a greater degree of sensitiveness and freedom from reticulation. Others state that drying may be done quickly, and affirm that no reticulation is produced thereby.

I will now glance at the preparation for printing. If the object be simply to get a print from any negative in permanent colours, then the only thing requiring to be done is to put a strip of paper over the face of the negative close to the edge, to partly protect the sensitised tissue from the action of light, and print for the required time; this will vary according to the negative used. But if any particular shape, such as oval, cushion &c., be required, then there are three ways by which the artist may obtain such results:—

1. By the method long used in silver printing, viz., masking the negative while the picture is being printed, and afterwards tinting the margin by exposing it to light while the printed part is covered up with a blank mask. For carrying out this method in pigment printing specially-prepared frames are required in order to get accurate registration of tint with the print. M. Lambert has a patent for frames for this purpose; Mr. G. Higginson, of Southport, advertises some special frame; and, after much thought and labour, Mr. Greaves and myself have devised what we think to be a very great improvement on both, and by the use of which much time and printing space are saved. Two of these improved frames are here for your inspection this evening.

2. This may be accomplished by placing a mask of the desired shape in the dark slide or other part of the camera, which mask is brought very near the sensitive plate; and thus the negative is taken of the proper or desired shape, leaving all the margin of clear glass. After varnishing, a mask of uniform texture, and of such a degree of opacity as will give the required tint of margin, is placed on the negative, the opening of which exactly coincides with the figure on the plate, and from such prepared negative pictures may be printed and tinted at one operation.

3. By having two masks carried in two swing-frames within the camera—one carrying the mask for the figure and the other the mask for the tint—a negative can be taken from which prints may be made with tinted borders at one operation. This last method is the subject of a patent, though I may say that months before the patent was taken out I named the method to Mr. Greaves, of Halifax.

The vignetting and tinting on pigment tissue has been found to be attended with very considerable difficulty, because the operator cannot see the progress of the printing. Mr. Witcombe, in an article which he contributed to the *Year Book* for this year, describes a method by which he produces vignettes. What success has attended his labours I am not in a position to say; but I think I can say with safety that Mr. Greaves, after much patient thought and experiment, has at length succeeded in producing tinted vignettes in carbon which are perfect gems of art, and which leave nothing more to be desired.

After printing there seems to be a variety of modes of procedure in preparing the temporary support. Some wax with fluid and others with solid wax. Some use one collodion and others a different one.

After mounting on the temporary support there is again a divergence. One artist says the prints must not be allowed to remain under pressure more than two minutes; then place in warm water—not hot—and the paper will strip off very easily. A second says the print should be under pressure for half-an-hour at least.

After development one advises the putting on of the transfer paper while still wet, while another advises drying first, and then wetting with cold water before it is put on. And so on, through every stage of the work, I might point out very wide differences in practice; but I refrain from going further, as I feel that I have already taken up too much of your time by these random remarks. Before concluding, however, I should like to give my opinion as to what I think would be good practice, especially for amateurs.

The tissue should be good in quality and of colour to suit the taste; it should be kept in a cool but dry place, and must not be allowed to become hard or brittle. It should be always as flexible as patent leather. I would sensitise in a weak bath of from one and a-half to two per cent. strength, and if acid neutralise with carbonate of soda, adding a few drops of glycerine to each pint of water. I should give a complete immersion, and for such time as would be needful to wholly saturate the tissue, thus getting more uniform sensitising.

I should then take the tissue out of the bath, and place it, face downwards, on a glass plate previously prepared, as recommended by Mr. Milner, by giving a slight coating of Castile soap (two grains to one ounce of methylated alcohol), after the manner of waxing a plate, and let it dry on the glass. If dried quickly, and the glasses placed one upon another so as to protect the tissue from the air, it will keep good for many weeks.

In waxing I should wax the plate by preference with solid bees'-wax, warming the plate, then make a few marks across with the wax, and while still warm polish off with flannel.

I should next coat with plain, thin, tough collodion—pyroxyline two grains to the ounce of solvents—using as much alcohol as possible, to prevent the waxing from being dissolved, and thus ensure easy stripping. The transfer paper should be well softened and carefully applied. After getting about half dry, put on the card-board (which has been previously damped) with thin glue, and dry by placing in a strong current of warm air. In a few hours the prints will strip off perfectly, and have a surface of the same character as the glass from which they are taken.

I have brought with me for your inspection and adoption, if you think there is any value in them—

1. A model of an apparatus for sensitising the tissue. This, as you will perceive, is a box carrying a number of rollers, around which an endless web is carried. The tissue is placed upon and attached to it, and then turned round, bringing the tissue into the bath, at the same time keeping it straight (without having to place the hands in the poisonous solution) until fully sensitised. From what we read of the damaging effects upon the health of the operator I think some such method should be used.

2. A drying-box, or chamber, divided by a number of partitions, which are alternately short at the top and bottom, thus making, when the door is closed, a continuous passage from the inlet to the outlet; and an induced current is made, either by burning gas within an iron chimney placed over one of the divisions of the box, from which there is an opening into the chimney, or by placing a small fan over the same opening, and worked by some mechanical power—by preference a small turbine water-wheel—by this means drawing a powerful current of cold air through the box, and thus drying the tissue in a short time. This same arrangement may be made use of to dry the newly-developed plates, and also after mounting on card-boards.

Thanking you for your patient attention to my stray thoughts, I hope that our meeting may not be altogether profitless.

John Smith.

ON THE SENSITIVENESS TO LIGHT OF VARIOUS SALTS OF SILVER.

Salts of silver may exhibit sensitiveness to light in three several ways. They may exhibit a visible darkening, or they may receive a latent image, and this latent image may have a capacity of being rendered visible either by receiving a deposit of metallic silver or by decomposition by alkalies in connection with reducing agents. These two last-mentioned phenomena are very distinct in their character, for in the first of them the image is produced entirely by the addition of silver not previously present. In the second no silver whatever is added, but that portion of substance which received the direct action of light undergoes decomposition by subsequent treatment. In both cases the action of light sets up a molecular change. The portions acted upon by light become, in the one case, more apt to attract a precipitate in the act of formation (for example, silver precipitated by ferrous sulphate); in the other case they are more readily attacked by certain reducing agents.

The silver compounds which exhibit the greatest tendency to form latent images by the action of light are, of course, the iodide, bromide, and chloride. But the same tendency is shared to a less degree by other compounds, and the latent image formed upon them may belong to either of the above-mentioned classes. The capacity of a certain number of silver salts to receive latent images, developable by a precipitate in the act of formation, was examined many years ago by Mr. Robert Hunt. Since then the matter has received but little attention, and, if I am not mistaken, no investigations have at any time been made as to the capacity of silver salts other than iodide, bromide, and chloride to receive latent images of the second sort, viz., those susceptible of alkaline development, in the entire absence of silver nitrate. This subject I have recently examined with the following results:—

Soluble salts of acids capable of forming insoluble or nearly insoluble salts with silver were selected and the surface of very pure paper was impregnated with them. After drying, the paper was floated on a solution of silver nitrate, containing about twenty grains to the ounce, acidulated with half a drop of nitric acid, sp. gr. 1·28 to the ounce of solution. The excess of silver nitrate was then washed out. One set of papers were then simply dried, another set were soaked for about a minute in a ten-grain solution of gallo-tannic acid, and then again washed.

The salts thus formed on the surface of the paper were exposed to a strong diffused light for, in some cases, twelve seconds, in others seven. They were then submitted to the action of a very weak solution of pyrogallol, ammonia carbonate, and potassium bromide, the latter being used to check the rapidity of the action of the other agents.

Silver citrate and *tartrate* both gave rather weak images. The citrate showed a strong tendency to irregular reduction. Nothing of this appeared in the case of the tartrate.

Silver platinocyanide gave a strong image, stronger than any other substance tried, except, of course, the silver bromide used for comparison.

Silver mucate gave a very faint image with much irregular reduction.

Silver pyrophosphate behaved in the same way.

Silver arsenite gave a moderately-strong image, coming next to the platinocyanide, and, like it, clear and free from all irregular reduction.

Silver sulphocyanide, an extremely faint image with much irregular reduction.

Silver antimonio-tartrate, a weak image entirely free from irregular action.

Silver fulminurate, weaker than the last mentioned, but also clear.

Silver nitrite, similar to the last.

Silver hippurate, an excessively faint image, with much irregular reduction.

The following substances showed (with the above-mentioned exposures) no trace of a latent image:—

Silver salicylate,
„ *valerate,*
„ *succinate,*
„ *sulphite,*
„ *resinate,*
Silver phosphate,
„ *metaphosphate,*
„ *tungstate,*
„ *ferrocyanide,*
Silver nitroprusside,
„ *chromate,*
„ *carbonate,*
„ *oxalate.*

As these experiments were strictly limited to the subject under investigation—viz., production of latent images capable of development by the action of pyrogallol and ammonia—it must be understood that the insensitiveness spoken of is *insensitiveness to this particular action* with a rather brief exposure, and under the conditions mentioned. And this action is that to which the iodide, bromide, and chloride exhibit their highest degree of sensitiveness, rendered evident by an exposure very much shorter than that given in these investigations.

As respects the action of tannin—which action was separately investigated with respect to every one of the above salts—it appeared that no substance, insensitive in the absence of tannin, acquired sensitiveness by its presence. It was also doubtful if in any case tannin increased the sensitiveness of any of these substances—a fact which, in view of the increased sensitiveness conferred by tannin on the silver haloids, is remarkable. M. Carey Lea.

—*American Journal of Science and Arts.*

NOTES ON PASSING EVENTS.

By a Peripatetic Photographer.

A point of no small importance to photographers at the commencement of the hot season has been raised by the letter of Mr. Bridle, who was officially connected with the late Centennial exhibition. The point in question is the keeping properties that may be conferred upon a wet collodion plate, so that a good negative can be developed upon it several hours after it has been prepared. But whether the weather be hot or cold, all photographers are interested in such methods of practice as will enable them to prepare a plate at home in their dark rooms, take a run to the country—if need be—and expose, and then rush back home to develope, all this being effected within such time as will permit of a few miles "by road or rail" to be passed over in the meantime. If this can be done *successfully*, is there any reason (I fancy I hear my brethren say) why we may not prepare our plates in the morning when we are enjoying a moment of leisure, and retain them in a state ready for exposure whenever from the visits of clients we are called upon to do so? Now, it will be admitted that if plates can be made to keep good during a few hours a boon of no inconsiderable value will be conferred on the professional photographer, whether he utilise these plates in the ordinary routine of portrait photography or in obtaining views of scenes within a few miles of his studio. Some are cognisant of the fact that this desirable end may be secured by salting the collodion with deliquescent preparations, such as the iodide of magnesium; the chloride of calcium is well known to be a powerful hygroscoptic, and several years ago, when the addition of chlorides to collodion was recommended, I used this salt with good effect. But I imagine that it is in another direction than that of the deliquescence of the salting agent we must look for the conferring of the property now desired, viz., that of allowing the plates to remain wet for some hours. The true direction in which to look is the removal from the surface of the sensitised plate of a large proportion of the nitrate of silver, which, when concentrated by evaporation, immediately dissolves the iodide upon which the sensitiveness of the plate depends, and which, when the evaporation is carried to a still farther extent, allows the nitrate of silver as well as the nitrates of the base of the iodisers to crystallise, and thus break up and destroy the film. The true method of preventing the occurrence of these evils is to immerse the sensitised plate in water so as to remove a large proportion of the crystallisable salts, and then to place it in a well-made slide, the surfaces of the inner parts of which are thoroughly protected by polish or lac varnish. Such a slide will, even in very hot weather, preserve its interior in such a state of moisture as to effectually prevent a collodion plate becoming dry during five or six hours; and the moisture of the plate chamber in the slide may be increased to a great extent by placing behind the plate a square piece of felt, or even ordinary woollen cloth, thoroughly moistened with water. A plate protected in this manner, and immersed for a few seconds in the nitrate bath previous to the application of the iron solution, will allow a clean, good negative to be developed, the details of which will come up as rapidly, and the intensity of which will be as great, as if the plate had been collodionised and excited only a few minutes previously.

I think that "Vox" has not quite correctly estimated the nature of the change which takes place in a carbon print when it fades, by associating such change with the photographic disease known as "yellow fever." The latter malady, I apprehend, is only correctly described when the whites—originally pure—become of a yellow tint, and the more delicate half-tints, if not the whole of the blacks, follow suit. But I cannot see in what way it is possible for a carbon print to assume the appearance of "yellow fever," because in the whites there is left literally nothing liable to change. The high lights of a carbon picture are represented by simple, pure paper, and nothing else; and no change can possibly take place in that which will not also take place in any or every piece of paper that is exposed to the action of the atmosphere. Place a new packet of envelopes on an ordinary mantelshelf for a few days or weeks; then remove the outside one, compare it with one from the interior of the packet, and observe to what an extent the former has become discoloured. If the exposure be protracted over some months the once immaculate envelope will be seen to have become of a dingy brownish-yellow colour; and this is the character of the only change that can possibly take place in the whites of a carbon print—such an alteration of tint, in fact, as we know frequently takes place in those of unprotected engravings. Nor can this change to yellow take place in the blacks of the carbon print, because with carbon as a basis, and with any kind of pigment mixed therewith to modify the coldness of the pure carbon, the utmost variation that could be induced by the action of light or of the atmosphere would be the bleaching of this modifying pigment, leaving the blacks rather colder and blacker than ever, and not yellower or more bleached. For this reason I incline to the opinion that the occurrence of "yellow fever" in a carbon print is an impossibility.

(To be continued.)

ALKALIMETRY.

[A communication to the Photographic Section of the American Institute.]

Preparation of the Standard Acid.—Ordinary sulphuric acid, one fluid ounce diluted with seven fluid ounces of water, and the mixture allowed to cool. Weigh one gramme of anhydrous carbonate of soda and dissolve it in about ten to fifteen cubic centimetres of water. Pour the diluted acid into the *burette* up to zero, and let it drop into the solution of carbonate of soda to which a litmus solution has been added. Let the acid in the *burette* drop carefully into a boiling flask containing the carbonate of soda solution till the colour turns red; now boil the flask to expel the carbonic acid. The process is finished if, after boiling, the red colour remain.

In our example we found that 6·4 cubic centimetres by the *burette* were used to neutralise the carbonate of soda, and we wish to form such a solution that ten cubic centimetres would neutralise one gramme of carbonate of soda. We have, therefore, the following proportion:—

Acid. Water. Acid. Water. Acid. Water.
10—6·4=3·6 ∵ 6·4 : 3·6 :: 200 : 112½

Equal the amount of water is required to make a standard acid solution.

To Test Commercial Carbonate of Soda.—One gramme by weight is treated as above described; and, of course, the less acid used the more impurities in the carbonate of soda on trial.

For example: if we use only 5 c. c. of the acid to neutralise one gramme of commercial carbonate of soda, it would follow that only one-half, or fifty per cent., of carbonate of soda is contained in the commercial article, while the rest is impurities. If, for instance, we used 9·1 c. c. of the acid, it would follow that the article on trial contained ninety-one per cent. of carbonate of soda.

In order to compare the strength of commercial ammonia with the carbonate of soda, we took for our example 10 c. c. of liquid ammonia, and used 41·5 c. c. of the acid until the blue litmus turned red. Hence it follows that 10 c. c. of the normal acid would neutralise 2·4 c. c. of ammonia; and as 10 c. c. of the acid also neutralises one gramme of carbonate of soda, it follows that 2·4 c. c. of ammonia is equivalent to one gramme of carbonate of soda.

$$\begin{array}{lccccccc} & \text{Acid} & & \overset{\text{c. c.}}{\text{NH}_3} & & \overset{\text{c. c.}}{\text{Acid}} & & \overset{\text{c. c.}}{\text{NH}_3} \\ \text{As} & 41{\cdot}5 & : & 10 & :: & 10 & : & 2{\cdot}4 \end{array}$$

Therefore 2·4 c. c. of liquid ammonia would be equivalent to one gramme of dry carbonate of soda.

In another experiment made with commercial carbonate of ammonia one gramme required 11 c. c. of normal acid to neutralise it. Therefore, 0·91 gramme would be equivalent to one gramme of carbonate of soda, or 2·4 c. c. of liquid ammonia, all of which will neutralise 10 c. c. of the normal acid.

To simplify the above proportion between the carbonate of ammonia and liquid ammonia, we demand how much liquid ammonia is equivalent to one gramme of carbonate of ammonia—

$$\begin{array}{ccccccc} \overset{\text{grm.}}{\text{NH}_4\text{O,CO}_2} & & \overset{\text{c. c.}}{\text{NH}_3} & & \overset{\text{grm.}}{\text{NH}_4\text{O,CO}_2} & & \overset{\text{c. c.}}{\text{NH}_3} \\ 0{\cdot}91 & : & 2{\cdot}4 & :: & 1 & : & 2{\cdot}6 \end{array}$$

Therefore, one gramme of carbonate of ammonia is equivalent to 2·6 c. c. of liquid ammonia.

How much carbonate of potassa is equivalent to one gramme of carbonate of soda?

$$\begin{array}{lccccccc} & \text{NaO,CO}_2 & & \text{KO,CO}_2 & & \overset{\text{grm.}}{\text{NaO,CO}_2} & & \overset{\text{grm.}}{\text{KO,CO}_2} \\ \text{As} & 53 & : & 69 & :: & 1 & : & 1{\cdot}032 \end{array}$$

Therefore, 1·3 gramme KO,CO_2 will be indicated by the same quantity of normal acid as one gramme of carbonate of soda.

How much caustic potassa is equivalent to one gramme of carbonate of soda?

$$\begin{array}{lccccccc} & \text{NaO,CO}_2 & & \text{KO} & & \overset{\text{grm.}}{\text{NaO,CO}_2} & & \text{KO} \\ \text{As} & 53 & : & 47 & :: & 1 & : & 0{\cdot}87 \end{array}$$

How much caustic ammonia is equivalent to one gramme of carbonate of soda?

$$\begin{array}{lccccccc} & \text{NaO,CO}_2 & & \text{NH}_3 & & \overset{\text{grm.}}{\text{NaO,CO}_2} & & \text{NH}_3 \\ \text{As} & 53 & : & 17 & :: & 1 & : & 0{\cdot}32 \end{array}$$

That is to say, 0·32 NH_3 will neutralise as much normal acid as one gramme of NaO,CO_2; but the commercial ammonia contains a great deal of *water*, which you can determine by the specific gravity of the liquor.

J. Chisholm.

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PHOTOGRAPHY IN COLOURS.*

8.—Applications and Improvements.—As to its applications, it would be puerile to undertake to name them. The solution of the problem of photography in colours responds to a universal desire. Chromophotography that I propose is able to reproduce on paper, on hangings, on glass, on porcelain, &c., pictures, collections of objects of art and natural history, flowers, landscapes, and, lastly, thanks to recent accelerations, the human face. Whilst rendering to science services of the first order it is serviceable to decorate our dwellings with inappreciable artistic riches, and to disseminate them on the least object of everyday use—even such things as paper weights.

Notwithstanding the fundamental principle of the triple proofs there may be circumstances where a fourth negative—a fourth monochrome—would constitute a real progress. If it be desired to reproduce a landscape where there are movable objects in their detail, or objects which glisten with exceptional brilliancy—for example, running water, a cascade, a sky studded with clouds—it would be advantageous to obtain, with a white light, a fourth negative—an instantaneous negative—under which should be formed a fourth monochrome—a black monochrome, or of a shade approaching black—destined to be superposed on the other monochromes. It will be superposed thereto either entirely or partially by recourse, in this last case, to reserves or opaque cuttings to mask the immovable or relatively dark parts of the picture. In this way the sensation and the charm of the reality are increased to a remarkable degree.

9. *Principles of Construction of a Triple Camera Adapted to the System.*—Simultaneousness and lineal identity of the proofs; supplementary correcting lens for flattening the bent field—the curved field of the image—and to give sharpness to the whole surface of the said proofs.

(1). *Camera.*—The rays coming from the subject to be reproduced are received upon a glass unsilvered with parallel faces inclined 45°, or thereabouts, in respect to the model and in respect to a first lens, towards which it reflects a part of the above-mentioned rays. The greater part of these rays traverse the first glass, and they are received by a second glass equally unsilvered and with parallel faces also inclined 45°, or thereabouts, in relation to the model and in relation to a second lens towards which it partially reflects the rays it receives. Lastly: the rays that this second glass allows to pass are received by a third lens either direct or by interposing a silvered or metallised glass, which reflects nearly all of them. The distance of this first glass to the first lens is equal, or nearly equal (slight discrepancies do not appreciably alter the results), to the sum of the distances of the first glass to the second, and of this latter to the second lens, and it will be equal also to the sum of the distances of the first glass to the third lens (or if a third glass is made use of it is equal to the sum of the distances of the first glass to the third glass *plus* that of that third glass to the third lens). In virtue of this arrangement the three images received by the three lenses are geometrically the same. As to their luminous intensities they will be very different; the image received by the third lens will be much the most brilliant. This third lens is naturally designed to furnish the slowest of the proofs, whilst the two other proofs requiring less light will be furnished by the two first lenses; of these two other proofs, the one A requires more light than the other—the proof B. This difference in excess in the lighting necessary to the proof A will be obtained by an assemblage of two or more unsilvered glasses superposed without being cemented together. To assure subsidiarily the rigorous unity of the time of exposure of the three proofs simultaneously there only remains to diaphragm unequally the lenses. As the two first lenses at least receive a reflected image, and consequently inverted, the corresponding sensitive plates must be transposed in their frames, and, to avoid all errors of focus and refraction in focussing, the focussing glass, which will be of analogous thickness to that of the sensitive plate, must be equally transposed. A preferable means to remedy the inversion of the images consists in the transfer of the three negatives on to a pellicle of gelatine or collodion leather, the slight thickness of which allows the printing of the positive proofs in one way or the other. We can also use the method of countertypes taken in the camera. If it is a question of reproducing by this described apparatus a very near object—for example, a small picture—it will be necessary to remedy the imperfections of the outline of the objects caused by the thickness of the glasses, which can be easily effected by interposing between the said apparatus and the model a magnifying glass, having the effect of placing the model further back. It need not be said that the glasses, the tubes of the lenses, and the front parts of the cameras should be shaded from diffused light, that the internal walls of this protecting shade should be blackened, the tubes of the lenses covered with black velvet, &c. To avoid the necessity of using large glasses, which would be very costly, the three cameras must be combined together in such a manner that the three lenses are as close to one another as possible. There are evidently many ways of varying this construction without departing from the essential elements thereof, and which I have specified above.

(2). *Correcting Lens.*—The diaphragms fitted to the lenses of ordinary photographic apparatus are intended notably to remedy the want of sharpness that the curving of the field of the lenses gives to the image in all the parts which are far from the centre. The increase of the time of the exposure—the inevitable consequence of using these diaphragms—is scarcely a grievance in ordinary photography, the preparations used being so exceedingly sensitive to white light. But when it is necessary to obtain proofs by green light or orange light the want of definition arising from very narrow diaphragms would necessitate exposures far too long. I have, therefore, been led to seek another means of giving clear definition over the whole surface of the proofs. This method consists in interposing between the lens and the sensitive surface, and very near to the latter, a concave glass having the same dimensions and the same outline as the image. This lens, which produces neither aberration, sphericity, nor astigmation, as a lens giving by itself the plane to the field of the image would do, has the effect, if the concavity which it offers is not exaggerated, to flatten the field in question, and if that concavity is well calculated it will give to the field an absolute plane. The concave glass may be with impunity simple in place of achromatic. As the curvature of the field diminishes notably in proportion as the lens is brought further from the sensitive surface, it will be advisable, if the objects to be reproduced are nearer than a landscape, to have two or three sizes of these kind of lenses. Care must be taken in the preliminary operation of focussing to place the correcting lens to be used, or a similar lens, before the focussing glass (always retaining the uncoloured glass to which the coloured glass is to be substituted).

Having now described and particularly set forth the nature of the said invention, and the manner of carrying the same into effect, I would have it understood that what I claim is—

First. The production in a camera of differently-toned monochromic negatives by causing the rays producing the same, either on passage to the lens or from the lens to the negative, to pass through different-coloured media during the exposure, as above described.

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* Concluded from page 250.

Second. The general arrangement and construction of the cameras described for the purpose of producing simultaneously three differently-toned monochromes under the influence of different-coloured media interposed, as above described.

Third. The two different methods specified for fixing the interposed coloured media in the above-mentioned or other cameras, as above described.

Fourth. The methods of manufacturing the coloured glasses or media, as above described, for the purposes set forth.

Fifth. The use and application of a correcting lens placed between the lens of the camera and the negative for the purposes stated, as above described.

Sixth. The methods or processes specified for producing or printing from such negatives photographic proofs in different monochromic colours, as above described.

Seventh. The methods specified of preparing, colouring, and sensitising papers for producing the said proofs, as above described.

And, Eighth. The production of heliochromic pictures by the superposition of monochromic transparent proofs of different colours, for the purposes and in the manner substantially as described.

MY STUDIO.

Operator No. IV.

The assistant Mr. Graham had trained turned out a good hand, and things went on fairly well, leaving me time to look out for another manager. None of the ups and downs of my first days visited me now; like a train, it kept to the rails, and, although sometimes going slow, it was always on the line and progressing.

Mr. Dick, the next manager I engaged, was a good hand at work, and for the first three months he was with me it was perfectly marvellous the quantity of pictures he turned out. He had one affliction which was quite unknown to me, and when I heard of it it quite took away my breath. One day he was not at his post as usual, and, thinking he might be ill, I sent to his lodgings to inquire, when I received a message from his landlady that he had not been at home all night. For three days he did not come, and I began to fancy that he must have left the town.

"I don't know what to make of it," I said to the assistant on the morning of the fourth day.

"I think he's on the spree, sir," he replied.

"He's on the what?" I said, in astonishment. I never dreamed of such a thing. "I did not know he touched drink," I said.

"Neither does he, sir, as a rule; but he told me lately that he has had the 'pin in'—so he called it—for fifteen months. But when it gets a hold of him he can't stop—so he informed me."

"Have you seen him since he left?" I asked.

"No, sir; but if it is the case he will be sure to be dropping in when his money gets done."

After waiting another couple of days, sure enough Mr. Dick made his appearance, and anything but "up to Dick." His eyes were glazed, his face was mixed yellow and white, his clothes were all torn and seedy, and they evidently belonged to some one else. I thought he must have pawned his own and got the new *old* ones in the old clothes market. He did not look the same man.

"Well, sir, what have you got to say for yourself?" I asked when he made his appearance.

"Oh! nothing, governor, nothing! I'm just an idiot; that's what I am," he said with an imbecile smile, as if it were a good joke.

"Then what brings you here?" I said, with rising anger.

"When the cow is thirsty she takes to the water. I want money, and I come to you. Will you lend me half-a-crown? I'm cleaned out."

"It would be as well if you got cleaned down also," I sneered.

"Yes, governor, that's so," he replied, chuckling to himself. "Cleaned out first, cleaned down after, don't you see? I'm doing it one at a time."

I could not keep from smiling. Anger was out of the question. He was not himself.

"Now," I said, in a tone of persuasion, "had you not better go home and get to your bed? You must know that you are not fit to be seen."

"I know, governor, I know. But I'm never seen, bless you! I'm 'cute. I dodge. I could dodge my own shadow round a corner when I'm on the beer. Now, look here, governor. I'll tell you what I'll do with you. You lend me half-a-crown and I'll go right away and drink it, and then I'll 'put in the pin,' on my honour. It just needs that other drop to turn the scales. I know fine what I'm going to do. You see I must have another smell at the sawdust and beer just to bid it farewell. You mightn't think it, governor, but sawdust and beer has for me a most enticing smell—the flavour of the fresh wood and the perfume of the heady liquor. That liquor has a good head when it gets into mine, but it tumbles it up awfully."

After allowing him to talk on much in the same senseless style, I took out half-a-crown and said to him:—"Now, I trust you. There's the money you ask. After you spend it you promise to go home and stay there until you are better." He caught at the money, and, when he was sure that it was in his possession, he replied:—

"Yes, governor, I go home today, and nobody will see me out again till I am all right. I swear it. Governor! is it not a sad pity that a man

> 'Should put a devil in his mouth
> To steal away his brains,'

and his clothes, and his boots, and his money?" and with this sound reasoning on his tongue he walked off round the corner to meet this same devil.

The following Monday he returned to work changed and repentant, slightly shaky, but his old self. He was an invaluable man but for this devil which seemed to lie in wait for him. He asked my forgiveness, which was freely granted.

"I'll not touch for a long time again," he said—"I hope never. But do you know, sir, it comes like a fever. It burns and burns till I feel that I must take something or die, and if I do take anything its all up."

"You must just try again, Mr. Dick. The longer between each spell, if you can do it, must tend to wear out the craving, don't you think?"

"I hope so, sir," Mr. Dick replied. He went away about his work as usual.

Take this man in his natural state and it was a treat to see him at his work. Working—ever working; no standing waiting on customers with him. He found plenty to do, and he was always doing it. His work seemed to be an intense pleasure to him, in spite of it being a duty, and the pleasure was reflected on the looker-on. If trade was slow he was looking out the best negatives for show-case prints. When they were finished, all pretty and presentable, you would see him getting up transparencies for the show-room windows. From the mending of a printing-frame to the retouching of a negative he could do everything well. He also possessed another quality that was of great advantage to the place, viz., a remarkable ease in conveying information to others, so that the people about him picked up his handy ways almost without knowing it.

After saving some money Mr. Dick left me and started for himself in a country town. When I last saw him he was doing well. He has but to keep from the smell of the sawdust and the beer to make money.

Murray Russell.

Meetings of Societies.

WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.

The ordinary meeting of this Society was held at the Oddfellows' Hall, Bradford, on Monday evening, the 7th inst.,—Mr. John Smith, the President, in the chair.

The minutes of the previous meeting having been confirmed, two new members were elected.

The Secretary then read a communication from the Glasgow Photographic Association regarding the autotype patents, when it was decided, on the motion of Mr. J. Crosthwaite, to adjourn the matter until the October meeting.

The President then read a paper entitled *Stray Thoughts on Carbon Printing.* [See page 256.] He exhibited several pieces of apparatus designed to promote pigment printing, viz., a mechanical sensitising dish, with a pair of rollers carrying an endless band on which the tissue was fastened—the rollers turned, and the tissue was thus immersed; an ingenious clip for drying tissue; a drying-box; and a frame for preventing the mounted picture from springing from the glass in drying, at the same time leaving the back of the card exposed to facilitate the evaporation of the moisture.

Mr. E. Greaves exhibited, in conjunction with Mr. Smith, one of his new patent printing and tinting frames for chromotype work; also, a case of small vignettes in carbon produced by his new method, which were considered by those present as almost perfection. The negatives were fine specimens of delicate manipulation, while the gradation of tint in the vignetting could not be surpassed.

The various pieces of apparatus were inspected with great interest by the members, most of whom are much interested in permanent printing. Messrs. Smith and Greaves were frequently called upon to answer questions regarding the apparatus.

Mr. A. Sachs considered the machine for sensitising the tissue unsatisfactory; he certainly thought the use of gloves would prevent the deleterious action of the bichromate on the system, and that appeared to be the only advantage claimed for the machine. There was, he thought, a great probability of the tissue, in its immersion, carrying with it numerous air-bubbles, which would require removing. Taking all things into consideration, he was of opinion that sensitising by hand was preferable. The drying-box he thought practicable, and the printing-frames of Mr. Greaves simply invaluable. He had tried several frames for the purpose, but had seen none to come near Mr. Greaves's for economy of time and excellence in construction. In his own establishment he used M. Lambert's, and thought they were superior to Mr. Higginson's; but Mr. Greaves's was far better than M. Lambert's. A great advantage was gained by manipulating nine at once. As to the vignettes he could not praise them too much. He had personally inspected the method, which was so simple that any boy could print them. As to the method of producing combination negatives in the camera: the great drawbacks were that the least inequality in the negative would prevent an even tint being printed round the margin, and the most scrupulous cleanliness was necessary, as a slight defect which would never be noticed in a plain picture would prove fatal to the marginal tint.

Mr. SMITH replied that he did not advocate the use of any such method commercially; but it was a ready mode for amateurs not desiring to go to the expense of registering-frames.

Mr. CROSTHWAITE remarked that Mr. Smith's paper taught some very useful lessons. Though not an exhaustive epitome of methods and formulæ, it showed plainly that equally good work might be produced by persons working very diversely both in methods of manipulation and formulæ. It served to demonstrate most unequivocally that if an experimentalist failed to produce satisfactory work it was probable that the principal fault lay with himself and not with the material. It had been very much the fashion of late to decry the material supplied, and desire for a change; but there was such a thing as falling out of the frying-pan into the fire. A good article and uniform in manufacture was what was wanted, and he (Mr. Crosthwaite) was afraid it would not be obtained by splitting up the manufacture and having a number of tissues of varying quality and colour in the market, which would vary as much or more than albumenised paper—that fruitful source of complaint. Carbon printing seemed to be very much like dry-plate work. With the same batch of plates one operator would produce clean, brilliant negatives, whilst with the same material another would get grey, foggy, worthless results. This, in most cases, arose simply from a want of experience in that particular method. Just the same reasons applied to carbon printing. When an operator had become perfected in a certain process by years of experience it was not to be expected that he would at once jump into successful practice in a totally different method. There must be a certain amount of practice and familiarity with the conditions under which he was working, otherwise success would be only occasional, and even then more by good luck than good management. It was important, too, that the apparatus and arrangements be of the best, and most easy of manipulation. Some of the apparatus shown that evening was of that kind, and seemed likely to be of very great service in the cause of permanent printing.

Speaking of Mr. Greaves's vignettes,

Mr. JENKINS remarked that he had seen them produced, and could speak for the ease with which they were vignetted, as the specimens shown were not specially got up, but simply selected from the daily work.

Mr. SACHS said that carbon vignettes had been produced for a long time, but the tinting difficulty had never been so easily overcome until now that Mr. Greaves had perfected his method.

Mr. W. Cook exhibited a tent for outdoor wet-plate work, of a very compact and complete character, and which was inspected with much interest by the outdoor workers present.

The usual votes of thanks were then awarded to Mr. Smith for his paper, to Mr. Greaves for the apparatus shown, and to Mr. Cook for the exhibition of his portable tent.

The meeting was then adjourned. The next indoor meeting will take place in October, but arrangements have been made for an outdoor meeting and excursion, on Wednesday next, the 6th inst., to Ripponden.

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THE PHOTOGRAPHIC SECTION OF THE AMERICAN INSTITUTE.

AT the January meeting of this Society, Mr. H. J. Newton, President, occupied the chair.

The minutes of the last meeting were read and approved.

Mr. J. B. GARDNER, as one of the Committee on Experiments, exhibited a number of prints that were made on the 19th of May, 1874. These prints were subjected to the ordinary light of a photographic room in order to test the method of removing the hyposulphite of soda by Mr. Newton's lead process. He had put photographic prints between the leaves of a book, others toned and fixed in the same way were placed in frames, and he found that those in frames kept better than those in the book. Other specimens he placed in the dark to see if there would be any change in them, but could detect none. He would suggest that these prints be next exposed to a stronger light, such as that of the street entrance to a photograph gallery.

The CHAIRMAN inquired if there was any record kept by the committee as to the time required to remove the hypo., as that would be an important item in the report.

Mr. GARDNER replied that he kept no record of the time occupied in preparing the specimens that were in his charge.

The SECRETARY stated that the prints in his possession remained in the lead solution from five to ten minutes, and that they had not been exposed to sunlight, but merely to light in the operating room, and part of that time in a closet. After printing, the pictures were soaked in the acid solution ten minutes. They were then washed in three changes of water and placed in a toning bath, which was compounded in the following order:—Thirty grains of the chloride of gold dissolved in twenty ounces of water, with carbonate of magnesia sufficient to neutralise the solution. Then was added the biborate of soda, lime water, tartrate of antimony solution, and, finally, water sufficient to make up the above to eighty ounces. The pictures, after being toned and fixed, were first washed in three changes of water (which took about three gallons in all) and then placed in the lead solution, where they remained from five to ten minutes. The final washing of the prints was completed by passing them through four changes of water, thus consuming much less time and less water (viz., one gallon to a sheet) than is commonly used by the ordinary modes of treatment. He would suggest that the prints be next exposed to sunlight.

The CHAIRMAN said it seemed that the prints were allowed to remain but a few minutes in the water—the time could not be more than fifteen minutes—and about five to ten minutes in the lead, which would make from fifteen to twenty minutes after they came from the hypo. In reference to the action of light upon pictures so washed he would say he had some that were five to six years' old that were exposed for seven or eight months to the action of the light most of the day, and there was no change perceptible in their appearance; and, at the same time, prints that were washed in the ordinary way exhibited considerable change. From what he had seen he inferred that no change would be found to occur in those treated in the way the committee had indicated. He would advise that the next experiment include prints treated by the ordinary fixing and washing method.

On the motion of Mr. J. Chisholm the report of the Experimental Committee was accepted.

Mr. J. Chisholm read a paper on *Alkalimetry*. [See page 258.]

A vote of thanks was passed to Mr. Chisholm for his very interesting and useful paper.

Mr. T. C. ROCHE said that in December, 1875, he prepared an emulsion which he had been using occasionally ever since; and now he found it to work as well as ever.

The CHAIRMAN said that in an article which he wrote in September last he alluded to the fact that he had been using the carbonate of soda as a developer for emulsion plates. He, however, gave no formula, as he was not quite prepared to do so. Having used it since continually with the most satisfactory results he would give his mode of working with it. He made a solution of two ounces of the soda in sixteen ounces of water, adding forty grains of bromide of ammonia. This solution keeps indefinitely, and in this respect, if no other, was superior to the carbonate of ammonia. Do not attempt to substitute the bicarbonate of soda, as it is a very poor developer unless first heated to redness, by which process one atom of carbon is driven off; then it will work the same as the other. This is, however, an unnecessary trouble, as the commercial article sold under the name of "sal soda" is pure enough for the purpose. When wished to develope a number of plates make a strong aqueous solution of pyrogallic acid—say fifteen or twenty grains to half-an-ounce of water; then pour into a wide-mouthed vial sufficient of the soda solution to cover the plate well. After washing the plate put twenty or thirty drops of the pyro. solution into the soda solution, and flow the plate. The image will come out, and the development go on the same as a bath plate, under the action of the iron developer. He made his pyro. solution in a low wide-mouthed vial, and used a dropping-tube to take it out. This tube had a rubber bag on the upper end; and, by pressing out the air and then removing the finger, it filled with the fluid, which was discharged into the vial containing the soda by pressing the bag at the upper end. This he let stand in the vial continually, and was therefore always ready. Do not use the pyro. solution after it is twelve hours' old. He advised an aqueous solution because he had never succeeded in developing with an alcoholic solution of pyro. to his satisfaction, or in getting results which would compare with those developed with the pyro. in water. The energy of this developer could be greatly increased by using in conjunction with it a solution of ammouia in water made and used as follows:—

Water	¼	ounce.
Ammonia, conc.	½	,,
Bromide of ammonia	20	grains.

When ready to develope add of this solution from three to twelve drops, according to the size of the plate; add this to the soda immediately before adding the pyro., and proceed as before. With this compound developer the exposure should not be more than one-half or two-thirds that required for the soda alone. It was much the most vigorous alkaline developer he had ever used. If the emulsion works thin, or gives a negative lacking intensity, it will gain greatly in intensity by the addition of the ammonia solution.

Mr. ROCHE exhibited a number of plates in the development of which there was no alkali used. They were transparencies. Some of the most delicate lines that could be made were shown here. They were carbon pictures, made by Lambert's process. It was the simplest process he had ever worked. There was no silver in the pictures. The finest tones desired could be secured by this method. He placed the pictures in boiling water for four hours, and they were not affected in the least. He next showed some pictures made in imitation of Mr. Newton's collodio-chloride. They could be printed by any one unacquainted with ordinary photography. Those shown were printed by a little girl. Before the silver paper fairly began to print the pictures were made.

A fine exhibition of transparencies was then given with Anthony's superb lantern. There was also shown some well-defined transparencies made by Dr. Miller, with Newton's emulsion. The Chairman also contributed a number of views recently taken by him.

A vote of thanks was passed to Mr. Anthony for the use of one of his fine lanterns and an attendant to work it; and also to Mr. Roche for the beautiful views he had exhibited.

The meeting was then adjourned.

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Correspondence.

LANTERN CONDENSERS.

To the Editors.

Gentlemen,—In consequence of some remarks which I saw a few months since in your Journal I purchased a lantern condenser of the symmetrical form, like that of the "sciopticon." I have used it with the lime light during the latter part of the season, and have found it superior to the plano-convex with bi-convex usually sold. The glass is of a more colourless kind, and the focus is shorter, being two inches for the sun's rays instead of two and three-quarter inches; hence there is perceptibly more light upon the screen, and light of a purer quality. The cone of rays transmitted by this condenser in the oxyhydrogen process is not brought so completely to a point as I have seen with some other forms; but with the power I use, which is a Derogy patent lens of five and a-half inches focal length and two and a-quarter inches aperture, I cannot perceive that there is any resulting want of definition in the image.

The best position for the lime spot, with the above-named lens, is at three inches from the condenser, and the rays then cross between the glasses. By bringing the lime cylinder up to two and a-half inches from the condenser the rays cross immediately in front of the anterior lens, which is the right point theoretically. Judging by the eye, however, the picture appears to me to be, at least, as well illuminated, and, perhaps, better, when the centre of light is at a distance of three inches.

The lantern makers will do well to make greater use of this four-inch symmetrical condenser, although I am not prepared to say it would answer for very long-focus lenses.—I am, yours, &c.,

Shotton Vicarage, Castle Eden, T. Frederick Hardwich.
Durham, May 28, 1877.

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COLLODION TRANSFERS, &c.

To the Editors.

Gentlemen,—This process of enlargement and printing seems but little practised by the profession. This appears strange when we consider the many advantages the process offers. I have some prints made in 1870, being for two years exposed to a south light, and although since then they have been in a damp cellar they show no sign of fading. Up to 15 × 12 there is no great difficulty in making them, and I think they look best or, at least, more artistic when transferred to plain paper, although enamelled paper is best for small-sized prints. The process is not hampered by patent laws, while the material is such as is found in every studio, and in everyday use. Why, then, should it not be more generally utilised?

I was much interested in reading Mr. F. York's description of street photography. I have had a long training in the same line, and have found just the same trials to one's temper that Mr. York has so well described. One plan of mine I have often resorted to with success:—Plant the camera in the street, carefully noting where the points of the stand come to, and make a mark for each leg, by which time the crowd begin to assemble. Then take the focus and make a show of exposure; now take away the camera and put in the dark slide, pull up the shutter, and leave all ready, waiting until the street is clear or nearly so; then quickly put the stand in its place and uncap the lens before the crowd can reassemble.—I am, yours, &c., Thos. Gulliver.

29, *Brunswick-street, Swansea, May* 28, 1877.

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THE DEVELOPMENT OF COLLODIO-ALBUMEN PLATES.

To the Editors.

Gentlemen,—The Rev. H. J. Palmer is quite mistaken in his impression as to the time taken up by me in developing collodio-albumen plates in his presence. I cannot, after so great a lapse of time, distinctly remember the exact number of minutes expended in developing the plates referred to; but as I gave in my letter, last week, what I have found in practice to be the average duration of development by the alkaline process, I think I should have remembered if, on the occasion of Mr. Palmer's visit to me, there had been any great departure from this rule, for I considered at the time that the plates had been fairly well exposed.

I do not usually develope plates with a timepiece before my eyes; but a few days after the appearance of Mr. Palmer's paper I commenced developing two plates, intending to take exact note of the time expended in going through the operation with the greatest possible care and without the least hurry. I carefully marked the time to a moment when I flooded the first plate with water before applying the developer. I washed the plate well after the development was completed, and, after immersing it in the fixing solution I proceeded with the second plate exactly as before, finished the development, again washed, and finally immersed in the hypo. bath. After a few moments it occurred to me that I had forgotten to keep time. I immediately referred to my watch, and found that exactly twenty-two minutes had elapsed during the operation of developing the two plates consecutively and the fixing partially completed.

In the particulars of his *modus operandi* I think Mr. Palmer has used too much acid and too little silver. I can quite understand that with such a large proportion of the "restrainer" in his solution the process of development is likely to be very much prolonged.—I am, yours, &c.,

Manchester, May 29, 1877. J. Pollitt.

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THE GUTEKUNST PANORAMA.

To the Editors.

Gentlemen,—According to your *Notes from America* Mr. Gutekunst thinks it strange the world has not heard more about my large photographs; perhaps, therefore, a little explanation may not be out of place in your columns.

First of all, I thought of sending them to the Crawshay exhibition, but the conditions were such as would prevent me obtaining a prize; in fact, there was no prize offered for panoramic landscapes. On another occasion I thought of sending them to the exhibition of the Photographic Society of Great Britain, but grave doubts seemed to haunt me as to whether the hanging committee would accept such large work; so I quietly allowed the matter to drop, and found afterwards that I should have been considerably out of pocket by following the matter up, as I had the satisfaction of seeing my doubts verified by the rejection of the Autotype Company's colossal picture. As mine are all mounted on canvas, fixed on a heavy stretcher, and placed in a large Oxford frame, each picture measuring in all about twelve feet by four feet, it is evident that I should have been led into considerable expense without any chance of a corresponding return. Such are my reasons for not exhibiting them.

As to placing one picture in critical comparison with his (as Mr. Gutekunst is pleased to term it), I have not the slightest objection to do so, provided he will send his picture to Jersey; and if Mr. Gutekunst's prices are not out of the reach of a poor experimentalist's purse I shall be happy to purchase one. In the meantime, Messrs. Editors, you have full permission to hand my address to any person wishing to see the panoramic pictures I possess. Any one availing themselves of this opportunity must be kind enough to notice that I can only receive them by appointment.—I am, yours, &c., E. L.

Jersey, May 26, 1877.

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A PHOTOGRAPHIC REFERENCE BOOK.

To the Editors.

Gentlemen,—Having been a reader of The British Journal of Photography since its commencement, I have noticed that many of the articles therein are by the Editors, and treat on subjects of still more and more growing importance, spread over a number of volumes. If I or any other of your readers wish to post ourselves up, and are in possession of these Journals in a bound-up state, we have only to look to the index, &c., and we have the information required; but if the information extends over six, eight, or ten volumes the indexes of each of these must be looked over. It often happens that there are articles in the Almanac (also by it's Editor) on the same subject. These must also be sought for and the table of contents looked over to find the articles on the subject.

Now, what I am about to suggest is this: that you should collect all these articles together, and, after weeding out such as were only of value at the time, or on some subject of little interest now, make the remainder into a "Photographic Reference Book," principally comprised of extracts from articles in The British Journal of Photography and your Almanac, here brought together so as to admit of very easy reference.

Perhaps you are ready to say—"Oh! but you have all the articles referred to in your journals, why not refer to them?" But, in reply, I say that they take up too much time in seeking them out; and although I have nearly all the parts, or weekly numbers, I have not all, some having been lost through lending, and some through careless assistants who did not know the value of them. Perhaps I have not twenty numbers short, out of the whole, since the commencement of the Journal; still the "missing links" break the continuity. I have totally lost two of your Almanacs of six or eight years back.

Now if this be my case—and I think I am a very careful man—what is that of those who do not preserve their Journals nor take care of their Almanacs? Perhaps it may be said—"That is their own fault, and they must now bear the consequences." It might, however, be said—"But to give all or most of those articles *in extenso* would make the work a very large volume, and also costly." Well, then, we might be satisfied with extracts and abridgments of them, embracing the most salient points, of course, and saying at the conclusion of such abridgments that fuller information may be obtained on referring to number so-and-so, on page so-and-so, or to the Almanac for 18—.

It might be urged as an objection that such a compilation must be very incomplete, being only parts here and there of a whole. This objection may be met by a chapter on the progress of, and improvements in, apparatus and processes that have undergone development in recent years, together with useful formulæ, tables, &c., &c., and a copious index of the whole. By far the greater number of the articles require no alteration, and might just be put into the printers' hands to set the type up. Such articles as those which have appeared in the ALMANAC, bearing on lenses, lanterns, &c., and which have been illustrated by diagrams, might be done so again, as the blocks are probably to the fore.

I think I have met most of the objections you are likely to urge against the suggestion. There is, however, one more, and that is that the ground is already covered by several useful manuals and works on these subjects, some of which have run through several editions, and some of them even very recently. It may further be said that the present time is inopportune. In hard times even five shillings would be an object of consideration. I do not think the ground has been gone over as it deserves. There has not been any work dealing with most of these points issued recently. Even in times of depression photographers can, and will, find a few shillings for anything really required that is to help them on in their business, and by means of which they may be enabled to make money. At anyrate I trust you will give the subject your consideration.—I am, yours, &c.,

Bridge Road, Stockton-on-Tees, May 26, 1877. J. T. CLARKE.

[The chief objection capable of being urged against the suggestion made by our correspondent is that which would be put from the *publisher's* point of view in the query—Would it pay to do so?—EDS.]

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IMPURE OXYGEN.

To the EDITORS.

GENTLEMEN,—I think it is due to your readers that I notice one or two remarks made by Mr. W. I. Chadwick in your issue of May the 18th; but before doing so I would ask them to divest his drawings of their disguise in the shape of large retort stand, weights, springs, handles, Wallace's burner, &c., and compare the retort or generator proper with my patent generator in the vertical position.

I am so satisfied that the horizontal position has many advantages over the vertical position in its present form, that I should perhaps be disposed to let Mr. Chadwick's infringement of my patent cut its own throat but that I know that it would get the portable oxygen apparatus a bad character; and, again, if I knowingly allowed the trade and public to be induced to render themselves liable to unpleasant proceedings for dealing in or using (whether successfully or not) an infringement of my patent I should be blameable.

Having thrown out these few works of friendly caution I will supplement them with a few simple truths omitted by Mr. Chadwick for reasons of his own, which will, I think, show that it is always wise to think when we read, especially some people's writings. I will also try to show a very simple and inexpensive way of proving the value of his newly-invented cakes, and also how far his statements are to be relied upon.

Mr. Chadwick says "the chlorate of potash and manganese are mixed and formed into cakes, which, when dry, are quite hard and extremely clean to handle." Let anyone test the correctness of this by mixing three ounces of chlorate of potash and three ounces of manganese, which are the proportions in the cakes used by Mr. Chadwick. Let them be formed into a cake, and notice how many hours or days it will take to dry quite hard and "extremely clean to handle." Everybody knows that glue water, gum water, size, starch, &c., &c., will cause even sand or whiting to dry in a firm mass; but I do not think any of these would add to the purity of the oxygen or to the safety of the oxygen mixture. But he says the chlorate and manganese will dry quite hard, &c. Let anyone try it. A larger proportion of chlorate will make hard plugs or cakes; but as it is the chlorate that *runs* as well as yields the oxygen, this running would bring the use of cakes to a dead stand, even if Mr. Chadwick had invented a suitable retort to cook them in, which he has not yet attempted, but simply disguised mine.

The cakes are Mr. Chadwick's invention, and are really only slices of Mr. M. Noton's plugs, with the drawback of being made with a much smaller proportion of chlorate and the addition of gum or glue, or something of the sort, which cannot add to the purity of the oxygen. Still he thinks he has made a valuable discovery, or he is trying to lead us to believe he has. Now, to put this to the test, I will undertake to have six pounds of chlorate put in cases ready for use, eight cubic feet of oxygen generated, and the exhausted cases cleaned out and refilled ready for use again, out of the six pounds of chlorate, in less time than he can make two pounds of chlorate into cakes ready for use, and generate four cubic feet of oxygen, and he may have two basins, two knives, two moulds, and two bottles of gum water, and I believe I could do this with half the hydrogen he would consume. I should have purer oxygen and more of it from a given weight of chlorate.

Mr. Chadwick says "the time from lighting the Bunsen burner until the oxygen began to come off was one minute and three-quarters." Now, in this he has not told your readers the whole truth, which is as follows:—He made three attempts before he succeeded in getting the Bunsen burner properly lighted, and then allowed it to burn some time before he put his cakes to bake. He said they were rather damp, as they had only been made a few days. From this I should think steam would come over before the oxygen; and, in trying this plan with the generator he alludes to, I find bubbles passing through the cooler in less than ten seconds, which is less than one-tenth the time required by him. He ought also to have informed your readers that it took him twenty-four minutes to cook two cakes, and that the oxygen generated with a powerful Bunsen burner and a full supply of gas did not amount to two cubic feet. This, he said, was generating oxygen "furiously." I was not surprised at this; for at the previous meeting he told the members then present that he could not afford to throw the exhausted cakes away, so he "simply threw them into a mortar, ground them up with some fresh chlorate, and used them time after time." I tried to show him that he would have the bulk without the oxygen; but I do not think he saw it. I have generally found the chlorate lose about one-third its weight in decomposition, so that, if I am not mistaken, Mr. Chadwick's oxygen mixture would contain about five ounces of chlorate to the pound of mixture and burnt gum. After this I think we must not be surprised if he tell us that he has found that the addition of a little sulphur and nitrate of potash to the mixture containing the burnt gum adds to its safety and the purity of the oxygen.

After I had read the short paper at our last meeting, I took from my pocket—where it had been carried all day without being wrapped up—a case of oxygen mixture in the solid form, which I said was the form I preferred, and which is made by making the oxygen mixture very slightly damp—not wet—before it is put in the cases. They may be used at once or put away until required, or the mixture may be used dry, as I showed; yet, in the face of this, Mr. Chadwick tries to lead your readers to think that I can only use the dry oxygen mixture, whereas the truth is I can use cakes or plugs wet or dry, or the oxygen mixture may be compressed in the case either slightly damp or perfectly dry. I have not heard of any other oxygen apparatus in which the same can be done.

In conclusion: I must say that I am sorry I have had to say so much; but, in justice to your readers and myself, I could not say less. I dare say what I have said will be thought discourteous; but I think we are too courteous when we allow wrong to pass for right, and at the risk of being thought discourteous I will always raise my voice when I can against any attempt to mislead or throw dust in my fellow-readers' eyes. If I had the abilities of some of your correspondents I am afraid I should be so very severe that no one would try this sort of thing a second time unless they felt they had a skin as thick as that of a rhinoceros.—I am, yours, &c., DAVID YOUNG.

Swinton, May 24, 1877.

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APPLICATIONS FOR NEW PATENTS.

March 1, 1877.—"Improvements in the Method of and Apparatus for Rendering Photographs Transparent. No. 821."—W. BROOKES.

March 31, 1877.—"Improvements Relating to the Production of Photographs on Woven Fabrics. No. 1264."—C. D. ABEL.

April 2, 1877.—"New Method of Producing Coloured Photographs. No. 1284."—W. L. WISE.

April 7, 1877.—"Improvements in Photography as Applied to the Preparation and Treatment of Pellicular Negatives, Transfer Pigment Printing, Pigments and Pigment Paper; and on Appliances to be Used therein. No. 1367."—J. R. JOHNSON.

April 21, 1877.—"Preparation of Coloured Photographs. No. 1560."—G. SCHNEIDER.

April 27, 1877.—"Photographic Apparatus. No. 1647."—W. B. WOODBURY.

May 5, 1877.—"Improvements in Photographic Printing and in Apparatus Employed therein. No. 1757."—E. GREAVES.

May 5, 1877.—"Photographic Printing-Frames. No. 1758."—E. GREAVES and J. SMITH.

May 7, 1877.—"Production of Photographic Relief Plates or Photo-Electrotypes for Printing. No. 1773."—W. H. MUMLER.

May 15, 1877.—"Photographic Apparatus. No. 1891."—B. J. EDWARDS.

May 17, 1877.—"Photographic Lenses. No. 1938."—F. VON VOIGTLANDER.

EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale*, that being done at a small cost in our advertising pages. This portion of our columns is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

Wanted, watertight bath, 9 × 7, and anything useful, in exchange for an Alex. Gaudin *carte* lens, number 9397. Address, Manager, 68, New-street, Ashford.

I will exchange a whole-plate portrait lens by Voigtlander (quick acting), or a carved oak table and Entrekin rotary burnisher, for a rapid rectilinear lens. Address, T. P., 36, Wine-street, Bristol.

Wanted to exchange an enlarging apparatus, to enlarge quarter-plate negative to 10 × 8, with three and a-half inch condenser and lamp complete, for a good half-plate bellows camera. Address, A. P. Z., Post-Office, Shelton, Staffordshire.

Burrows and Colton's *Art of Retouching*, perfect; Wall's *Manual of Colouring;* Hardwich's *Manual of Chemistry*, second edition; Newman's *Colouring in Oil and Water*, offered in exchange for good lantern slides, comic or otherwise. Address, Thomas Gulliver, 29, Brunswick-street, Swansea.

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ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

Notice.—Each correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a *nom de plume* as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

W. M.—The matter to which you refer is receiving attention.

W. Sutcliffe.—The intimation will appear in our next number.

A. Collier.—The oil stains can be removed from the carpet of the reception-room by smearing them over with a paste composed of fullers'-earth and water, allowing some time to elapse, and then brushing away or removing the fullers'-earth by washing with water.

T. M. D.—Make a paste of the finest rouge and water, charge well with it the fleshy part of the thumb on the palm of the hand, and rub smartly the surface of the lens affected by the stains. A few minutes' friction, if energetically applied, will speedily ensure the removal of the stains.

Henry M. Lindsay.—It is very possible that what has been termed the "beer and albumen process" may suit your purpose. Try it, as well as the tannin and coffee processes, and if you find they fail to give you the required quality of picture either try some other method of preparing your dry plates or write again.

George Scott.—We are not aware by what means the tone of the transparency you so much admire was obtained; but we do know that tones of a kind similar to those you describe can be obtained upon albumen pictures by immersing them in a mixed bath of chloride of gold and hyposulphite of soda. Of this fact we are very well assured.

E. R. J. says:—"I have no doubt many of your readers are interested in fancy bazaars. Perhaps some of them would suggest a simple and inexpensive method of exhibiting for sale photographs at one of these—a stand or any arrangement by which three or four dozen *cartes*, or one to two dozen cabinets, could be shown. Any suggestion would oblige.

F. G. Sampford.—Without occupying a considerable amount of time—which we cannot at present spare—in referring back, we are unable to give you directions "how to paint a background in distemper, without glaze, and pliable, so that it can be rolled and moved about without cracking." If any reader, under whose eye this may fall, can convey the information desired we shall be glad.

M. N. O. inquires:—"What is the proper way to mix dextrine for mounting prints? Should it be mixed with boiling or cold water, and in what proportion? Should the dextrine be used hot or cold? and does it turn sour like starch? I use starch at present for mounting on unenamelled cards, but the prints get loose at the edges."——Will any correspondent give the information required?

J. Schofield.—Mr. Giberne, in the lucid description of his method of developing collodio-albumen plates, and which was given in our Almanac for 1873, says:—"I was in the habit of giving fifteen or sixteen drops of a solution of nitrate of silver sixty grains to the ounce of water to two ounces of the pyrogallic and citric acid intensifier. This proportion I have reduced to ten drops." Does the quotation here given meet your requirement? If not, write again.

X. Y.—To utilise your photographs for book illustration, trace them over with a sharp steel pen dipped in lithographic transfer ink, adopting a free and sketchy style. Then, after the drawing has been completed to your satisfaction, send it to a lithographic printer, who will print *facsimiles*. We, however, suggest, as the wiser course, your sending the photographs to a lithographer, telling *him* what you wish done, and instructing him to have the work carried out according to your requirements.

Patlander.—The fogging of the plate has undoubtedly arisen from the light radiated from the white ceiling of your room. If it be not convenient for you to enclose the light in such a manner as to prevent its illuminating the ceiling, we recommend that a large disc be suspended at the height of a few feet above the light. This disc should be of such dimensions as to intercept all the light that would impinge upon the roof, and of such a colour as will ensure the light that is radiated from it doing no harm to the plates. A deep brownish-black colour, painted so as to be dead, will prove quite suitable.

E. L. A.—Each of the methods described is excellent, but, nowithstanding, we shall give you one method more:—If the plate be old and has been protected by a coating of varnish, immerse it for a few minutes in a very hot solution of washing soda, by which the films will be removed and the surface of the glass left clean. After rinsing in water apply a mixture of tripoli (rotten stone) and dilute nitric acid, rub smartly with a suitable pad or rubber, and finally wash with water. If the plate be new, the application of a little Spanish whiting mixed with water, followed by friction, will be all that is required.

W. D. R.—An orthoscopic or orthographic lens, if good, will answer your purpose quite well. If a lens of this kind, having a focus of *about* fifteen or sixteen inches, be obtained, the amount of cushion-shaped distortion in a picture of the dimensions specified would be so small as to be barely appreciable. We are aware of a photolithographer who turns out excellent work, mostly maps, the lens employed by him being a single achromatic landscape lens. As the focus is somewhat long in proportion to the dimensions of the size of plate he uses, the distortion is reduced to a minimum, while the marginal definition, even with a large diaphragm, is good.

H. Lancaster.—We had lost sight of the fact of prior publication when writing the article. The President of the Berlin Society could not possibly speak with "authority" concerning the details of Rousillon's method of producing engravings, seeing that the latter gentleman has abstained from publishing any such details. We have hitherto imagined the Rousillon process to be similar to that of Mr. Woodbury; but it is very obvious that we can never be certain of this so long as M. Rousillon declines to afford any information with regard to his *modus operandi*. The publication of the details of the method of forming surface blocks without under-cutting must still remain in *statu quo*.

T. W. Kirby.—1. The rapidity of this as well as every other description of lens depends upon the relation between its aperture and its focus. We have only had the opportunity of examining one lens of the kind mentioned, and it seemed to us to be moderately rapid. Its manufacture has, however, been discontinued for several years.—2. Yes.—3. The wood of which cigar boxes are made will not affect gelatino-bromide plates.—4. The emulsion will prove rapid enough for your purpose if used in a moist state, but the ordinary prepared plates will not answer the intended purpose.—5. The object of using a solution of gelatine in the developer or previous to its application is connected rather with the physics than with the chemistry of development.

A. W. B. puts the following questions:—"1. What means would you advise for the utilisation of remains of emulsions made by Canon Beechey's formula, with excess of silver?—2. How am I to prevent, in the above emulsion, when poured on the plate, immense numbers of minute holes in the shadows and sky, and flocculent aggregation in the film after thorough filtration?—3. Can the focus of a triplet be materially altered either way?"——In reply: 1. Let all the "remains" be treated with bromide of potassium so as to ensure the conversion of all the nitrate of silver. When in this state, especially with an excess of the bromide, the emulsion will keep good for a long time.—2. This question we are quite unable to answer.—3. By altering the focus of the central, or concave, element of the triple combination a very great alteration will be effected upon the focus of the system as a whole. The substitution of a front lens differing very slightly in focus from that in use will also effect a very great difference in the focus of the combination.

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South London Photographic Society.—The next meeting of this Society will take place on Thursday next, 7th inst., at the House of the Society of Arts, John-street, Adelphi, when a paper on the *Nitrate Silver Bath* will be read by Mr. B. J. Edwards.

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METEOROLOGICAL REPORT.

Observations taken at 406, Strand, by J. H. Steward, Optician.
For the Week ending May 30, 1877.
These Observations are Taken at 8.30 a.m.

May.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks
24	30·22	NE	44	49	54	43	Dull
25	30·25	NE	45	49	64	41	Dull
26	30·20	W	51	55	68	47	Foggy
28	29·27	W	52	59	63	45	Cloudy
29	29·59	W	50	57	63	46	Cloudy
30	29·64	W	49	56	64	45	Cloudy

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 892. Vol. XXIV.—JUNE 8, 1877.

LATERAL HALATION.

Prompted by the occurrence of certain partially-recognised but very obscure phenomena connected with halation in bromide of silver films, we have been led to bestow a good deal of attention upon one particular phase of this annoyance, and in the hope of being able to throw a little light upon this subject we give the results of our investigations so far as they have been completed.

Two kinds of halation are familiar to photographers, each of them being of an entirely different character. These we some time ago designated respectively "optical" and "chemical" halation, employing the latter term to describe the excessive action of the iron developer in those portions of the image in wet collodion plates in which a black, or transparent, part of the film is surrounded by a white portion, which in the immediate vicinity of its margin assumes an undue degree of intensity. This description of halation is peculiar to wet plates. By optical halation, on the contrary, is understood that abnormal action of light so well known to dry-plate photographers in consequence of which the light impinging on the plate from the lens, not being all arrested by the film, passes through and is reflected and re-reflected forward again from the back surface of the glass plate, causing decomposition of the atoms of bromide of silver upon which such reflections react. It is to still another and less-understood kind of halation—if, indeed, "halation" be a proper term for it, of which we are doubtful—that we now direct attention.

When, owing to the thinness or translucency of a film, only a small portion of the light is arrested, leaving the rest to fall upon and be reflected from the back surface of the plate, the remedy naturally suggested to rectify the halatory evils arising from this cause would be the increasing of the density of the sensitive layer of silver haloids composing the surface, so as to ensure the whole, or at anyrate *more*, of the light being debarred transmission; for it is evident that the greater the amount of light arrested by the film the less will be lost.

Grafting practice on to the theory expressed up to this stage, we began our experiments by the preparation of several gelatino-bromide plates, some of them having a coating so very thin and transparent as almost to render it a wonder how any picture could be developed at all upon such attenuated films. Others were exceedingly dense, the density being in some instances secured by giving to the plate successive coatings of a very "full-bodied" emulsion.

Having exposed the plates to a subject specially selected with a view to its forming a crucial test object for the purpose desired, we found that even in the densest films there was nearly as much halation as in those which were nearly transparent, the halation, however, partaking of a somewhat different character. Continuing the experiments, we found that in these dense films the halation was not caused by reflection from the back of the plate, as in optical halation proper, but that it arose from some influence being conveyed *laterally* in the film, one atom upon which light had acted transmitting these influences to those in immediate contact with it, and these in turn "passing it on," although in a diminished ratio of intensity, to those in their immediate vicinity. This gave rise to the hypothetical inquiry—Can it be that each atom of bromide of silver is, in its physical constitution, like a little sphere of transparent glass which, when it receives the impact of a beam of light, acts as a radiant, and flashes it out against every other transparent sphere in its vicinity? The most obvious way to decide such a question was to call in the aid of the microscope to discover the nature of the atoms of bromide of silver. This we have done, and were scarcely prepared for the revelations afforded.

It is generally believed that bromide of silver may, by the adoption of certain methods in its preparation, be deposited in either a fine or a coarse condition. By the method adopted by us we obtained it apparently as one of the coarsest precipitates we had ever seen, by the decomposition of nitrate of silver and bromide of ammonium. This precipitate was washed in numerous changes of water so as to remove everything of a crystallisable character—a circumstance to which we invite attention. When dried and subjected to examination under a low power in the microscope it was evident that what to the unaided vision appeared to be coarse atoms were in reality clotted, aggregated masses of atoms. Having selected some of the finer of these for examination by a higher power we found that they, too, were composed of numerous atoms very firmly attached to each other. One or two of these, which were about the dimensions of an atom of starch powder (some of which we had on an accompanying glass slide to serve for purposes of comparison), were, by means of firm pressure with a minute steel spatula, accompanied by a dragging motion, broken up so thoroughly that we considered we were in a position to subject the atoms to systematic examination.

By the employment of powers of the lower kind—in this instance those under one-fifth of an inch—these atoms assumed the form of opaque specks. By increasing the power of the objective to the one-eighth of an inch the atoms showed very decided indications of being transparent; indeed, they appeared either transparent or opaque according to the portion of the atom that was in the focus. We may here observe that throughout our observations we were employing object glasses of large angular aperture, which, as every microscopist knows, possess very little penetrative power. The one-twelfth of an inch power established the fact of the atoms being perfectly transparent, and this was confirmed by a further examination with a one-sixteenth object glass used with an eyepiece, which combination gave a magnifying power estimated at four thousand diameters. Some of the coarser atoms—that is, those about the size of a starch grain—when examined as an *opaque* object by a very high power appeared exceedingly beautiful, not unlike a heap of white eggs in miniature fastened together by some kind of cementing material.

What conclusions, then, it may be inquired, do we draw from such examination as we have made? To this we reply—

Firstly, and from the physical point of view: the atoms of bromide of silver being so exceedingly small, there ought to be no difficulty experienced in causing a bromide emulsion to pass through a filter of a finer texture than most of those employed for purposes of filtration. We are unaware that any reader has employed as a filter for bromide emulsions two thicknesses of the fabric known in commerce as superfine West of England cloth; but, in the course of some filtration experiments arising out of the examination of the silver haloid in question, we have found the atoms to pass easily through this material. The coarser atoms—or, rather, the aggregated masses of atoms—will be intercepted, but the finer particles will pass through. But it must not be imagined that filtration can be effected through a medium of this kind in the ordinary way. It is essential that the method of enforced filtration by means of a glass cylinder and a piston—which apparatus we have before described in connection with the filtration of collodion—must be had recourse to. This method we prefer to all others, because of its rapidity and the perfection of its action.

Secondly, and from the optical point of view: we find that lateral halation may be reduced by the interposition of any atoms of a yellow tint, such as those of iodide of silver. It was some time ago proposed to reduce halation by mixing with the collodion or gelatine of which the film was formed some colouring matter of a non-actinic character, several of the aniline preparations having been employed for the purpose. But this, as might have been foreseen, greatly interfered with the sensitiveness; because, with a coloured body interposed between the surface of the film and the sensitive atoms imbedded in that film, deterioration of the actinic power of the light ensued.

We conclude the present inquiry by observing that a plate coated with a thin emulsion, but backed with a non-actinic, aqueous varnish, gave a negative more free from halation than a plate coated with a thick and very "creamy" film, a non-actinic backing not having been employed.

INTENSIFICATION BY MEANS OF BROMIDE AND CHLORIDE OF COPPER.

Before leaving the subject of intensification, to which we directed attention in our last number, we have a few words to say in connection with another novel method recently brought into prominence through the instrumentality of Captain Abney and Mr. Warnerke, and consisting in the use of bromide of copper, followed by a strong solution of silver nitrate. The novelty of the method consists not so much in the employment of the copper salt as in the subsequent treatment of the bleached image, by which an entirely new reaction is set up.

As our readers are well aware, the use of chloride of copper for purposes of intensification was recommended by ourselves about two years ago; but with that salt the increased density is obtained by the application to the bleached image of the ordinary alkaline developer. The reaction which occurs is not one of development strictly speaking, for the action of light takes no part in the change effected; it is, rather, a purely chemical change brought about by the reducing power of the alkaline pyro. upon the chlorised image, even without any previous exposure to light. When bromide of copper is used the action is also purely chemical, and consists, as Captain Abney showed in his communication to the Photographic Society of Great Britain, of the formation of an image composed of bromide and sub-bromide of silver in combination, the metal of the sub-salt being derived from the silver solution with which the bromised image is treated. There are one or two points associated with this explanation of the reaction which deserve a little consideration—as, for instance, the stability of an image so composed, and also the power afforded of adding to a feeble picture, otherwise useless owing to lack of metal to work upon, an extra supply of metallic silver, which, by conversion into one of the haloids, may be utilised in connection with any of the ordinary methods.

Another point we have considered worthy of experiment is the comparative behaviour of the two salts, the bromide and chloride, under similar conditions. Judging from the generally similar action of the chlorides, bromides, and iodides, speaking from a chemical rather than a photographic point of view, it might be supposed that the result would be, if not identical, at least proximately so, whichever haloid were employed; but such is not altogether the case, as we shall proceed to show.

In our earlier experiments with chloride of copper we looked upon the bleached image as virtually consisting of chloride of silver alone; but certain phenomena induced us to adopt the belief that the copper in some way participated in its formation, existing, possibly, as we suggested, in the form of white sub-chloride. This view has been since corroborated by Captain Abney's analysis of the corresponding bromide image. The symptoms which caused this change of opinion may be briefly noticed. In the first place, the chlorised image is rarely of a pure white, as might be expected if it consisted only of silver chloride, while the tone, when noticeable, never partook of the violet tinge usually characteristic of the chloride when feebly acted upon by light; this, however, in itself could perhaps scarcely be taken as of much importance. The next thing which struck us was the density of the bleached image by transmitted light as compared with an ordinary film of silver chloride, and also the richness of its colour. The appearance was such as to suggest the idea that some fresh material had been absorbed into the image, and, indeed, its subsequent behaviour under the action of the alkaline pyro. would lead to the same view; for it is difficult to believe that, with a fixed quantity of metal to work upon, the mere rearrangement of the atoms by redevelopment would result in a very considerable accession of strength.

The strongest proof, however, that the image was not composed of silver chloride alone was found in the fact that it discoloured rapidly if washed in ordinary tap water containing the usual impurities; very weak ammonia, also, was found to blacken it superficially. It is obvious that, if the image were composed of silver alone, neither ammonia, alkaline carbonates, or chlorides would produce such an effect. Captain Abney has now conclusively demonstrated the fact that in reality the bleached image consists partly of copper.

Starting with the theory that the images obtained with the bromide and chloride of copper are identical in composition—that is, that they consist, respectively, of bromide and chloride of silver and sub-bromide or sub-chloride of copper—it is reasonable to suppose that their subsequent behaviour would be similar; and our experiments show that such is practically the case, the slight differences in behaviour being due apparently to the variations in the affinities of the respective halogens. Though by transmitted light the bromised and chlorised images are scarcely, if at all, distinguishable, by reflected light they are widely different. Independently of the difference in appearance of the bromide and chloride of silver, the bromised image exhibits no tendency to discolouration if left to soak in ordinary water, while the other changes rapidly even when distilled water is employed, the picture darkening in all its natural gradations. Treated with weak ammonia the chlorised image is, as we have said, blackened, while the bromised becomes noticeably thinner, and the subsequent action of either nitrate of silver or alkaline pyro. is considerably weakened, if not altogether destroyed. Solution of a soluble bromide applied in the same manner to the bleached picture produces, in the case of the chlorised film, an apparent increase of density, without discolouration, by transmitted light, with a diminution or suppression of the subsequent intensifying power. The bromised image under the same treatment undergoes no immediate change, but the colour of the intensified picture is different and the effect reduced. The comparative action of alkaline pyro. is in favour of the chloride of copper, while the contrary is the case when the bromide is employed.

In the course of our experiments with the bromide of copper we have used the solution prepared by decomposing saturated solution of the sulphate with bromide of potassium. The solution of sulphate is heated with the necessayy quantity of crystals of bromide, and when the latter is dissolved the dark, turbid mixture is allowed to become cold, and is then filtered from the excess of sulphate of potash and a slight trace of sub-bromide of copper which are deposited. The sulphate of potash, being soluble to the extent only of between fifty and sixty grains to the ounce at ordinary temperatures, crystallises upon cooling, and a large proportion of it is thus got rid of. If bromide of barium be used in place of the potassium salt insoluble sulphate of baryta is formed, and after filtration a nearly pure solution of bromide of copper remains. Whether the results differ with the two solutions we are unable to say.

Though great variety is noticeable in the degree of density obtainable by this method, we are of opinion that its chief, if not only, use will be in connection with reproductions of engravings and similar work. Very great density is obtained with a solution of silver of the strength of eighty to a hundred grains to the ounce; but, if we attempt to secure a lower degree of density by employing a weaker silver solution, the result is uncertain and irregular. Very weak negatives in half-tone, however, are improved unless there exist a tendency to harshness, in which case the evil is only increased. We have spoken, in a previous article, of the facilities this method offers for adding fresh silver to the original image; but, except in special cases, that will be found too roundabout a way to secure its being generally adopted. For subjects devoid of half-tone, however, we can recommend it as the least objectionable means of securing extreme density that we are acquainted with; but the greatest care is required in washing after bleaching the image, or a deposit is formed between the film and the glass which it is impossible to remove. The plate should not be exposed to the light after bleaching until the silver solution has done its duty.

STEREOSCOPIC FALLACIES.

A new method of obtaining stereoscopic relief in photographic portraits is claimed to have been discovered by a writer in the *Builder* of last week.

In most toyshops, bazaars, and establishments in which optical instruments are sold is to be found a simple piece of apparatus constructed somewhat on the principle of the *camera lucida*, and intended for a similar purpose. It consists of a small plate of glass which, when fixed in a saw-cut in a wooden base, is thus retained in a vertical position. When the sheet of glass thus erected is placed on a table in front of the observer, all the objects situated upon one side of the plate will be seen by reflection; and if a flower, a drawing, or, indeed, anything else of a similar character, be placed in front of the sitter, and the vertical glass moved towards the right, all these objects will be seen so vividly reflected, when looking upon the surface of the glass, as to render it a very easy matter to draw them all upon a sheet of white paper placed on the table at the other side of the glass. This is easy, because the right hand and the pencil are seen through the glass, while the reflection from the real objects appears as if projected upon the paper, all that is then required being to trace their outlines with the pencil. This is the principle of the *camera lucida*, whether a Wollaston prism or the plain glass reflector be the optical medium employed.

Assuming, what we most readily admit, the possibility of withdrawing for examination either the paper upon which the drawing is being made or the original which is to be cartographically reproduced, the writer in question says, very appositely, that in copying a portrait by the appliance just indicated the substitution of any other face than the original one would be attended by a falsification of the image, and a consequent destruction of the true identity. This fact is quite as true as this further one, viz., that if, when a schoolboy was tracing upon his "transparent slate" the drawing of a cat placed underneath, some one would, when such drawing was half finished, remove the model drawing of the cat and substitute that of a dog the finished result would prove somewhat "mixed."

We now quote from the author, who says:—"At this point, then, the reader may be requested to surmise for himself the arrangements that have been devised for communicating to the image, as presented in the mirror, the utmost possible degree of vividness, and for efficaciously utilising the apparatus as an agent of judicial identification." We should much have preferred that the author had assumed the reader to have been quite unable to have "surmised for himself" such arrangements as would render this toy an agent of "judicial identification," because we are of opinion that photographers, if they wish to compare one picture, signature, or document of any kind with another, will scarcely be likely to have recourse to such a rudimentary piece of apparatus to enable it to be done, more especially as, for reasons we shall presently give, such a comparison cannot possibly be made by means of the instrument.

The remainder of the article in which is embodied the stereoscopic discovery of which we have spoken is as follows:—

"These details consist, in the main, of certain accessories for directing a powerful concentration of light upon the portrait, with the employment of a mirror-plate of superior quality and of an especial tint. Thus furnished, it is next necessary that two life-size photographs shall be so arranged under the light and on the reverse sides of the mirror-screen that the vividly-illuminated features of the one shall be perfectly imaged at the precise angle and point of sight where the other appears. All being satisfactory, an entire novelty awaits the investigator. For, in the event of the photographs being those of the *same person*, and the attitude corresponding, then, *at the precise moment when perfect unison is reached*, one single image starts suddenly into existence, with all of those statuesque effects hitherto deemed peculiar to the stereoscope, and with all the vivid realism of life itself! It will suffice to say that I have not here specified all the paraphernalia requisite to bring about these effects in their most brilliant form; but the general principle will be sufficiently obvious to the intelligent reader."

It is on record that when the attention of Mr. Henry Lee was directed to a certain definition of a crab in which it was stated to be "a red fish that walks backwards," that eminent naturalist announced it to be right in all but the following points, viz., that the crab is *not* red, it is *not* a fish, and it does *not* walk backwards. This, in some degree, is our position as regards the "stereoscopic effects" discovered by the writer in question.

If two photographs—whether large or small, whether portraits or landscapes—be placed side by side and one of them viewed *directly* and the other by reflection, they will not, nay cannot possibly, coincide, because *one of them will be reversed* in its relation to the other. If the experiment be tried by placing side by side on a table two photographs of a gentleman in profile, and a plate of glass be placed on edge between them so as to enable the image of one to overlap the other, the result, so far from being a coincidence, will show the nose in one picture to be projecting from the back hair in the other, and *vice versa*, producing "confusion worse confounded."

But this is not all. Even supposing that the anticipated union of lines could really be made to take place (which could only be done by the adoption of two prints from the same negative, but one of them being *reversed* in regard to the other), the result would not be a picture having stereoscopic relief in any, even the slightest, degree. All that could possibly take place would be the presentation to each eye of a picture that is a *facsimile* of that which is presented to the other. But *this* does not afford the conditions under which stereoscopic relief is presented; for to secure such conditions something very different is needed. It is essentially the one primary condition of stereoscopic relief that the two pictures must be different with regard to the point of sight from which each has been taken. One must be taken from a position a little to the right (or left) of that of the other; for if both be obtained from the same point there will exist no difference between the two, and if there be no difference there will be no stereoscopic relief. Dissimilar pictures of this kind, when projected upon the retina of each eye, can alone give rise to the phenomenon so well known as stereoscopicity.

PRECAUTIONS IN ENLARGING.

Our opinions on the usefulness and the scope of enlarged negatives are well known, and it is scarcely too much to say that, *a priori*, there is no reason why an enlarged negative should not be in every way equal to one of similar magnitude taken direct, with the exception of such a slight falling off in definition as would only be perceived in very occasional subjects—such as those composed, in the main, of a multitude of minute detail as, for instance, would be found in a finely-executed map.

But in no case need pictorial effect or excellence be in the slightest degree interfered with—if, indeed, it were not increased—in the process of amplification. If proof were needed, we have before us as we write a print from a thirty-six-inch negative which is of a crucial character, as regards optical achievements, from beginning to end. The original negative was on a whole plate, the subject being a lofty mill, with a tall chimney on one side of the picture, and telegraph wires crossing the whole field from side to side. Every brick in the edifice is depicted with startling minuteness, and as far as the top of the chimney the definition is excellent; it is only near the edge of the picture that it is perceived the telegraph wires are at all wanting in sharpness, the deficiency here being due to the original negative and not to the process of enlarging.

Yet it is needless to say that negatives of the typically-excellent class we are speaking of are rarely produced. Generally there is to be noticed either hardness or flatness, or a peculiar chalky effect similar to that seen in a much over-developed negative. These faults, together with fogginess and halation of a more or less pronounced character, are obtained with such frequency as, in many instances, to be looked upon as necessary concomitants of the process.

We have on former occasions pointed out what we consider the best method of obtaining photographic excellence in enlarged negatives, and we shall now proceed to point out some precautions in connection with optical requirements, the observance of which will materially tend to increase the beauty of the negatives obtained. These precautions suggested themselves to us recently as we were examining an enlarging apparatus belonging to a gentleman who could never obtain pictures entirely free from fog. The enlarging was done in a small room, which became, in fact, the camera. As it was evident that no light came into the room through cracks, &c., we turned our attention to the lens—a portrait combination reversed in position, *i.e.*, the back of the lens to the negative to be enlarged. Placing ourselves in the cone of rays proceeding from the lens, and looking into the latter, we noticed the presence of a bright ring of light, which was caused by the blackened interior of the lens shade having become polished from the frequent use of the cap, which fitted inside and not outside the lens front. The reflection was quite enough to produce a slight amount of fog, and the inferiority of inner to outer caps was thus shown. Further examination revealed other defects, which we shall notice *seriatim.*

The edge of the circular aperture of the diaphragm with continual handling had also its black surface removed, and formed a reflecting surface visible from any point occupied by the ground glass. It will scarcely require to be noted that, whenever a spot of light can be seen by placing the eye in the position of the sensitive plate, fog will ensue if sufficient exposure be given. The greatly weaker light used in portraiture from life, and the absence of direct light falling upon the diaphragm under ordinary conditions, render this burnishing of the diaphragm unnoticed in the usual studio routine.

Upon approaching nearer to the lens, and looking askew into it, we perceived a series of markings of a very strange character. For a moment we could not explain their cause, but at last we discovered it; again the markings were caused by an improper surface upon the diaphragm, which, instead of being as near dead as possible, appeared to have been blackened once and then blackleaded. It acted by reflection from the anterior surface of the back lens of the compound, the side of the diaphragm next the original negative receiving a great amount of light, and, black though it was, reflecting some white light and producing a veiling more or less slight by reason of its image being spread out all over the plate, and thrown, as it were, upon the true image in both lights and shadows. When the diaphragm itself was moved by an assistant, while we were examining the image thrown upon the ground glass, a distinct motion of the fogging agent was plainly perceptible.

Bending our attention next to the transparency *in situ* undergoing the enlargment, we were struck with the effect of a paper screen, placed in the usual manner, so as to mask all that portion of the negative not required. A slight movement given to this screen drew attention to as complete an example of halation as it is possible to find; the whole inner margin of the screen was fringed with a delicate edging of light, and this edging could be increased or diminished at will by uncovering or covering a portion of the bare glass hidden by the screen. It was thus rendered perfectly plain that one cause (if not the chief one) of halation is to be found in the intensity of the flood of light falling upon the negative or transparency to a degree which is not paralleled to any extent when photographing from life. The transparency had a margin of clear glass, and, by leaving off the screen altogether, the negative was utterly ruined by the ensuing diffusion of light, which gave universal fog. By masking certain portions of the clear margin of the transparency the spreading of light was quite under control, from the general diffusion to the slight fogging on one side or other of the negative, as the bulk of the clear space was masked in one place or the other. The effect of too much light upon the *cliché* in enlarging is sufficiently well-known; but a repetition of the experiments we named would be full of instructive hints to any who cared to take the trouble, and we may say that we never before saw the certainty of a cause of halation demonstrated with such nicety.

We had also an opportunity of observing the extent to which parallax can spoil definition and lead to blurring when large stops are used. The negative of a lady with a double row of beads round her neck was enlarged, and as the light was poor the diaphragm used was little less than equivalent to the full aperture. It was found that no alteration in the focussing could cause the beads to come up sharp, and not until a much smaller diaphragm was inserted could a sharp negative be obtained; then the ill effect vanished, and complete definition followed.

It may very pertinently be asked—Why should not all these effects follow when photographing from life? The reason they do not is that the lights and shades of the transparency or negative are in a scale quite different from those presented either in the studio or in landscape work; this consideration, in conjunction with the thickness of the film, whereby the effect of parallax is rendered more prominent, will explain any difficulty that at first prevents the full comprehension of the subject.

One of the most powerful—if not, indeed, *the* most powerful—detergents for refractory plates with which we are acquainted is the mixture of sulphuric acid and bichromate of potash recommended by Mr. M. Carey Lea some years ago. It is especially useful with glasses which have been frequently used, or which from the nature of the treatment they have undergone resist the action of both acids and alkalies completely. Its utility is dependent upon the powerful action of chromic acid upon organic matter, and we have never yet met with a plate which did not succumb to its treatment. One precaution is necessary in using it, however; it must be carefully removed from the glass by copious washing as soon as possible after it has done its duty. If allowed to soak for some time, as is frequently the practice, the plates appear to absorb the solution (the penetrating power of which is extraordinary), or an insoluble compound becomes firmly attached to the surface and stedfastly refuses to be displaced. Though generally invisible, it results in a peculiar mottled appearance between the glass and the developed film which entirely ruins the picture. We recently treated a number of plates which had become useless from this cause with various detergents, including acids as well as alkalies, but to no purpose; friction with various abrading powders failed to remove the defect, and we were wellnigh compelled to give it up. Remembering, however, that cyanide of potassium has been utilised by carbon printers for the purpose of reducing the strength of over-printed proofs—which it does by virtue of its action upon the insoluble compounds of chromium—we resolved to try its efficacy on our refractory plates, when, presto! all the mottling disappeared as if by magic. Those amongst our readers who dare to fly in face of all that has been lately written upon the dangers attending cyanide and bichromate of potash have here a "wrinkle." Surely those who have dared bichromate will not fear the minor dangers of cyanide.

COCCULUS INDICUS AS A PRESERVATIVE, AND OTHER NEW PRESERVATIVES.

During the past season I have devoted much time to researches in new directions, and one of these has been the search for a better preservative than those we have in common use. It is rather remarkable that few, if any, new preservatives have been introduced for years past that have obtained a favourable position; and yet, among the vast number of substances that tend to improve the action of the silver haloids, it seemed highly improbable that the very best should have been hit upon at the first.

Believing, as I do, that a mixture of silver bromide and iodide is more sensitive than either taken separately, and also that the presence of silver chloride is valuable to promote clearness and avoid any tendency to fog, I preferred to experiment upon a sensitive surface containing all these three haloids. My experiments were made on paper development—partly because it was more convenient, and partly to avoid as much as possible the inhaling of ether fumes, which I find very injurious. I intended subsequently to verify these results with collodion more completely than I have yet been able to do. So far as I have done this the results are confirmatory. As the season is advancing rapidly, and as I shall shortly terminate laboratory work until next autumn, I prefer to give the conclusions I have reached without making so long a postponement.

The net result of the examination was the finding several substances that gave results every way better than those commonly used. Upon the whole I rather preferred, among several nearly equal, the substance I have named at the head of these remarks—*Cocculus indicus.* This substance occurs in medium-sized brown berries, very light and brittle. A decoction is easily made—first pounding them to a coarse powder, and then pouring over them four or five times their bulk of boiling water and letting stand for about an hour. Or the berries can stand with cold water for a few hours, and then be made to boil, and filtered while hot. This infusion can be used precisely like coffee; or it can be mixed with a solution of gum and sugar, as is often done with tannin or with gallic acid.

Cocculus has shown in my hands most excellent qualities. The sensitiveness was high and the image clean and vigorous. It is much more difficult to fog than tannin, and every way brighter and better.

Other substances were found that gave excellent results. *Bryony* does so. An infusion of bryony made in the same manner as directed for cocculus gave results so nearly equal to it that it was difficult to decide which was the better. Bryony has the advantage of being a comparatively harmless substance, whereas cocculus is a virulent narcotic poison. Under some circumstances the comparatively innocuous nature of bryony is an advantage. It is to be recollected, however, that in the way employed cocculus can do injury only by mistake or carelessness. It does not, like potassium cyanide or like ether, poison the atmosphere. Still its poisonous nature is to some extent an objection, and this may be avoided by substituting bryony.

Quite a number of other substances were found which gave very fair results, amongst which may be mentioned:—*Alkanet, Berberin tree bark, Corydalis formosa (root of), Stavesacre, Wormwood, Yellow berries,* and *Gratiola officinalis;* also *Arica nuts* gave a fair result. Some substances from which good results might have been expected failed signally—for example, *Phloridzin* and *Gambir.* Very many others were tried, with results not worth specifying.

Cocculus and bryony are, therefore, the substances I would mention as being worth a careful trial.

I quite agree with the Editors in the opinions expressed, some months back, as to the importance of the "fog-restraining" property in a preservative. There is no doubt whatever that a sensitive film containing silver haloids (bromide alone, or all three) is more liable to fog or stain than when certain organic matters are present. When a film containing haloids only receives an invisible image, and has the developer applied, the developer has a tendency to attack the whole film; those parts that have been acted upon by light are the first to yield, but by degrees all the rest follows. Our object is to increase this electric tendency to attack the exposed parts principally and to spare the rest. A small quantity of bromide in the developer is useful for this object; but only a limited amount of useful effect can be obtained in this way, and much more can be done through the selection of the organic matter applied to the film. These matters show a very wide range of action; some tend to destroy the electric power of the developer altogether and to produce fog, and from this opposite result there is every degree of action. When this action is too marked it not only protects the unexposed parts, but even diminishes or destroys the action of the developer in those parts that have received an impression of light, but a weak one. We see this easily in the developer when too much bromide is used. We are less familiar with its action in the preservative, but I do not doubt that most dry-plate workers have observed this tendency in *gallic acid* when used in the preservative. Gallic acid has a wonderful effect in brightening up a plate and increasing the electric tendency of the developer, directing it to the exposed part and checking it from acting on the unexposed. *Gum,* on the contrary, heightens the tendency of the developer to act on every part. If tried alone on an emulsion plate a thin image flashes out, and is presently buried in fog. I noticed this many years ago when the use of gum was almost wholly unknown, and saw then that if the way could be found to manage it rightly it would be invaluable. Mr. R. M. Gordon accomplished this by combining it with gallic acid, and the explanation of the great success of his gum-gallic treatment lies in the fact that the actions of the two substances are exactly contrary, experiment showing that instead of neutralising each other they supplemented each other. It is, however, very curious that their useful application is extremely limited. When I first tried my method of applying a preservative bath to an emulsion that had been allowed to set and before washing it, it was with no little surprise I found that the gum-gallic treatment failed utterly, and that I must look in very different directions for the preservative suitable for that particular process. It would appear from this that gallic acid needs to remain in the film and must not be washed out, as may be done with tannin. Whether or not this is universally true I cannot say; it certainly is so with emulsion plates.

So far as my experiments have gone cocculus appears to possess both the merits that are separately sought for in the gum-gallic process, and in a higher degree. The characteristic action principally in cocculus is *picrotoxin,* and this is, probably, the main agent in its sensitising action. But it is probably not the only one. Extractive and gummy matters contained in the berry have, probably, also their influence.

M. Carey Lea.

CARBON *VERSUS* SILVER.

In the course of a few months, when the patent which, whether valid or not—according to the views of different sections of the photographic world, but which has undoubtedly kept the practice of carbon printing in the hands of a select few—shall have lapsed and become public property, it is only reasonable to expect that a great impetus will be given to the art. The public will only be too glad to adopt the more permanent process, and will insist upon being supplied with pictures produced by it; that is, if the members of the profession are true enough to their own interests and place the question before their patrons in the proper light.

That the interest taken by a certain section of the profession in the art continues to increase is evidenced by the columns of the journals devoted to photography, the directions for producing these pictures being given and repeated over and over again, with all the variations which the experience of each writer suggests; and though there is, in the main, an immense amount of repetition in the majority of these articles it is unavoidable and, indeed, necessary to prevent constant reference to other writers, in order to render each article complete in itself.

Still, though a large number of our leading artists have taken up the subject warmly, there is no doubt that a very considerable number of photographers have taken but small interest in the progress of the new art, and remain in as complete a state of ignorance as to the principles involved in it as the majority of the public, and who would be puzzled to reply to the question which is now often put—"What is the difference between a *carbon* print and an *ordinary* photograph?" To such, therefore, it may be well to point out the difference between the two classes of print, and in such terms as will convey to a non-professional person an accurate idea of the matter without entering into a technical description of the details of the processes employed.

I take it, then, that the matter may be summed up as follows:—An ordinary photograph depends for its production upon the action of light *altering the colour* of a *surface* sensitive to it, according to the intensity of its action, such *surface remaining always uniform in thickness;* while in the case of a carbon print the result is obtained by the action of light, penetrating, to a greater or less depth, a *mass* of material subjected to it, and so causing a change in its constitution. In the former case the action is stopped, by means of a chemical solution, removing that portion of the substance which the light has not changed without altering the thickness of the surface in which it was formed; while in the latter the action is made manifest by simple solution in water—thus, as it were, by mechanical means removing that portion of the compound which the light has not reached. In this case the lights and shades of the picture are produced by unequal thicknesses of the substance employed, but without altering in any way the colour of the material of which the image is composed.

Between the two kinds of pictures, then, there exists to some extent the difference subsisting between a painting and a bas-relief. In the one, the effect depends upon different colours or tints on a level or uniform surface; in the other, upon different thicknesses of substance, the material being of uniform tone. Chromium.

ANOTHER METHOD OF WORKING THE GELATINE PROCESS.

[A communication to the Liverpool Amateur Photographic Association.]

I have devised the following method of working the gelatine process in the hope that it may suit the convenience of those who are not able to devote any time during the middle of the day to making emulsions. The formula with which I have been most successful is that published by Mr. J. King, namely—

Nelson's opaque gelatine	40	grains.
Bromide of potassium	40	„
Nitrate of silver	56½	„
Water	2½	ounces.

In making the emulsion proceed as follows:—At about nine a.m., or any convenient time in the morning, weigh out as carefully as possible the bromide, and put it into a teacup or other similar vessel, pouring on it about one ounce of water. I then add the gelatine, cover up the cup to keep out dust, and leave it without any further care till five or six o'clock in the evening, or later if more convenient. The gelatine must now be dissolved and the emulsion made. To effect this place the cup, a small glass beaker (in which has been previously dissolved the silver in about six drachms of distilled water), and a suitable bottle, in a shallow tin dish half filled with cold water, and supported on a retort stand above a Bunsen's burner, which is now lighted. Having allowed about ten minutes for the materials to get thoroughly warm, pour the silver into the gelatine, stirring briskly all the time and for about a minute longer. Then transfer the emulsion from the cup to the beaker, and thence to the bottle, rinsing out the cup and beaker with a little water, which is also added to the emulsion, and then shake up most thoroughly for two or three minutes. The emulsion must now be kept warm by any convenient means for a few hours. At about ten p.m. pour it into a flat porcelain dish 7 × 5 inches, and leave it the whole of the night to set. Next morning plunge the dish into cold water in a mug sufficiently large to contain it, cover it up from the light, and there let it remain the whole of the day. At about six p.m. change the water, and let the emulsion remain in it an hour or two longer, then drain it for a short time; it is now ready to be dissolved and filtered previous to coating the plates.

The most convenient way of doing this is to pour a little water into the tin dish, on the top of which dish is placed that containing the emulsion (but not in the water); light the Bunsen's burner, when the hot steam which rises will very soon effect the solution of the emulsion, which should then be filtered through a bit of sponge. Then proceed at once to coat the plates in the manner so often described before.

After allowing the emulsion which remains to set in the bottle I have been in the habit of pouring a little strong alcohol on the surface, hoping that it would thus keep indefinitely and would be always ready for use by simply pouring off the spirit and then remelting; but in this I have been disappointed. I find that after it has been warmed up two or three times the gelatine seems to lose in a great measure its power of setting, the emulsion becomes very thin, and the film made with it frills up during development in a very curious manner. I am in hopes that a little fresh gelatine will remedy this defect, but have not yet had sufficient time to investigate this matter thoroughly. I will now say a few words on the prevention of blisters, which are the bane of the gelatine process.

Before proceeding to develope flow over the plate a little common methylated alcohol; then wash off thoroughly by placing the plate in a dish and changing the water three or four times. Since adopting this simple precaution I have never seen a blister. At first I used a little pyrogallic acid dissolved in the alcohol, but now find that this addition is neither necessary or useful.

I generally use the developer recommended by Mr. R. Kennett, but do not find any very material difference between developing a gelatine and a collodio-bromide plate. The gelatine plates, however, often lose excessively in the fixing bath, and, in consequence, require strengthening up a little subsequently. This I never attempt to do till after the negative is dry, when I remoisten it with spirit, wash, and then apply the usual acid silver and pyrogallic solutions, with which I can get any amount of density, the difficulty being to know exactly when to stop.

There is one thing I have omitted in the proper place, and that is, in the hope of making the emulsion keep better I have thought it desirable to increase the proportion of gelatine in the above formula from forty to fifty grains. And now, in conclusion, allow me one word of apology for the negatives shown. I beg you will not look upon them as finished productions, but as purely experimental ones—indeed, almost first attempts. Still I think they are sufficiently varied to show the capabilities of the process. H. Houlgrave.

NOTES ON PASSING EVENTS.

By a Peripatetic Photographer.

I am not alone in wishing that some of the eloquence with which Mr. John Laing, "F.R.S.S.A.," has descanted on the imperfections of our ordinary means of ventilation had been diverted into the channel of giving a somewhat fuller account of the improved and patented article upon which his paper read before the Edinburgh Photographic Society treated; for beyond being told that it consists of four sections, each acting independently of the other, we are left in ignorance as to its nature or construction. I do not at all doubt its excellence; all that I venture to suggest is would be the propriety, in a paper devoted specially to the purpose, of giving such information respecting it as would afford data for each reader arriving at a proper conclusion after due examination for himself. I hope that such information may yet be afforded.

Gaping crowds in front of cameras are veritable "cusses," and the reading of Mr. F. York's experience in connection with such nuisances thrills with a sympathetic chord through the artistic mind of every nomadic photographer. I recollect well how, when in the autumn of 1869 I was engaged in taking a series of photographs of the narrower streets of Cairo (on the occasion when I sent these passing *Notes* to you by steamer from Alexandria), I was terribly annoyed by the groups of swarthy, semi-clad natives who clustered around my camera, and persisted in placing themselves in front of the lens. Remembering a ruse adopted by the late Marcus Sparling, when engaged in similar work in another part of the world, I obtained a large and imposing-looking French half-plate portrait lens redolent of polish and lacquer, and, screwing it upon a piece of wood, I attached this to the side of my camera, and directed my attention towards the quarter to which this dummy lens was pointed. The result was that the insignificant little bronzed lens in front—the real worker—was discarded in favour of its more pretentious rival; the streets were left clear at the points I wished to be clear, and I obtained all the negatives I wanted. While on this subject I would advise those who wish to practise street photography in Cairo or, indeed, any other towns in Egypt with any degree of comfort during the hot season to take rapid dry plates with them in preference to working wet collodion, which can only be successfully worked with much inconvenience.

I certainly cannot agree with the Editors of this Journal when, in the course of a preliminary notice of a printing-frame patented by Mr. E. Greaves, they say that "the difficulty of producing vignetted carbon prints has always been acknowledged." Certainly no special acknowledgment of such a difficulty has ever been seen by me, unless perhaps from one or two operators belonging to that class who experience difficulty in making their developer flow, in varnishing a negative without producing streaks, or in getting the portrait of the sitter in the centre of the plate. But provided the "safe-edge" precaution be not lost sight of there is no more difficulty in producing a vignette in carbon than there is in silver. Mr. Greaves's idea of placing an elastic air-chamber at the pad of the printing-frame is novel, and cannot fail to be useful, because it will bring an uniform pressure upon every part of the plate, the degree of pressure being, presumably, regulated by the quantity of air that has been blown into the cushion.

The contribution of Mr. Edward Milsom, of Lyons, to the perfecting of the application of gelatine emulsion to paper is gladly welcomed. Already, by following his directions, which look more complicated than they really are when carefully followed, I have succeeded in obtaining pellicular negatives which now repose within the leaves of my somewhat large note-book. They were taken on a flexible sheet of paper, with an exposure under ten seconds, and their gradation and perfection of definition leave little more to be desired.

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* Concluded from page 258.

FOREIGN NOTES AND NEWS.

News from Morocco.—Change of Colour of a Butterfly's Wing Caused by the Action of Light.—The Sensitiveness of Purpurine to the Action of Light.—German Photographic Statistics.—The Illustration in the *Mittheilungen*.—On the Breaking of Negatives in the Solar Camera.—Siemens' Pressure-Hardened Glass.

The *Mittheilungen* has received news of the expedition to Morocco which started from Germany about the end of April. It has arrived safely at Tangiers, where Herr Remelé has been occupied taking views and groups of the natives, utilising the halt made before setting out for the interior.

It has long been supposed that the colours of the butterfly's wings suffer from exposure to concentrated light, and, according to the *Institut*, M. Capronnier has recently been making experiments with a view to ascertaining what sort of light bleaches most strongly. The result arrived at is that, as in photography, after the white light the blue light is the most actinic.

Dr. Vogel gives a few details with regard to the sensitiveness to light of purpurine, which has been so much talked of recently in connection with the sight purpurine of the eye and the recent experiments of Kuhne with the eyes of oxen, rabbits, &c. Purpurine—a dyestuff found along with alizarine in madder—gives a solution which, in the presence of a little alkali, is extraordinarily sensitive to light. Other solutions of dyestuffs themselves actually more sensitive to light—such as fuchsine, alcanna red, and santaline—do not lose their colour after several days' exposure to light. In clear weather a wine-red-coloured solution of purpurine becomes colourless in about ten minutes, and even by lamp light, at a distance of twenty centimetres from the lamp, in about half-an-hour it will be distinctly apparent that the colour has begun to fade. Dr. Vogel's former experiments show that in this bleaching its power of absorbing yellow rays plays an important part. An alkaline solution of carmine is also sensitive to light in the same way, though not to the same extent, as the alkaline purpurine solution. Schunk and Römer found that alkaline purpurine also lost its colour in the dark, and that when deprived of air it did not bleach either in the light or the dark. It follows from their experiments that oxygen is necessary to the bleaching of purpurine. Anyone can, however, convince himself by a simple experiment that purpurine is much more readily bleached in the light than in the dark.

Mix with ten cubic centimetres of distilled water about ten drops of a saturated tincture of purpurine and one drop of ammonia; divide the beautiful rose-coloured fluid so obtained into two equal parts, and put each part into a test tube. Cover one of the test tubes with black paper and place both in the window. After the lapse of ten minutes compare the two glasses, when, even if there be only daylight without sunlight, the liquid in the uncovered one will be found to be a good deal bleached, while that in the protected tube will scarcely be changed at the end of a couple of hours.

This month's number of the *Mittheilungen* contains Herr Goltzsch's third article on the advantages of reviving stereoscopic pictures, this one being devoted to stereoscopic portraits. The same number also contains a statistical account of the number of photographic establishments in Germany—estimated at a little over three thousand—and of the quantities of chemicals they consume, an average of three pounds per establishment being allowed as the consumption of nitrate of silver, and its cost being estimated at about £27,000 sterling. Of this large quantity it is supposed that about sixty per cent., or the value of £16,400, is annually lost in one form or other as waste. The value of the gold salts used is estimated at a quarter or, at most, a third of the sum allowed for silver—that is, at about £9,000. Owing to the quantities of albumenised paper exported through dealers and of French mounts imported it has been found almost impossible to assign figures to these last two items. The number of frames made in Berlin—of which, however, only a portion is used in Germany—is stated at an annual product representing £7,500.

The illustration which accompanies this month's *Mittheilungen* is a really fine lichtdruck reproduction of an engraving of a mastiff and a puppy. A copy in gelatine was made of the original negative, which was then transferred to stone and printed by Herren Schindler and Mey, of Moscow.

In the *Monatsblätter* Herr Geldmacher has an article on the causes of the cracking of negative plates in the solar camera. Although he is aware that every photographer is acquainted with the construction of a solar camera, he thinks it as well, owing to the unusually large dimensions of his apparatus, to commence by giving a short account of it, which may here be thus briefly summarised:—It is placed with the reflector at the north-east, and the easel with the printing-frame at the south-west. In this way the sun lights the reflector almost the whole day. The front of the outer chamber is only high enough to shelter the combination lens, and rises rapidly towards the back to a height of four metres, and the reflector being placed four metres from the lens this arrangement allows the light to fall almost perpendicularly upon the mirror. The latter, being movable, follows the sun's apparent movement, while no direct sunlight falls upon the lens itself. The combination lens is plano-convex, and has the convex side turned towards the reflector. It has a diameter of one metre and a curve of about twenty centimetres; the focus is about two metres. At the side of the lens is the regulator by which the movement of the reflector, following the sun, is controlled. Between the condenser and its focussing point is an iron camera, in which a dark slide, holding the negative to be enlarged, is moved backwards and forwards by means of an endless screw. At the end of the camera an objective is placed so that the focussing point of the condenser falls exactly between the lenses. The whole length of the chamber, exclusive of the distance between the condenser and the reflector, is ten metres.

The breaking of the negative sometimes happens because it has not the shape required for enlarging, or because it is too small; and in order to get a much enlarged copy it becomes necessary to use a very small objective, and then the focus point is too near the plate. The principal cause of breakage occurs when the whole surface of the negative is not lighted. Within the circle of light the plate is strongly heated, while the edges remain cold and almost invariably crack. To prevent this the unlighted part should be cut away with a diamond. This should be done, also, when one wishes to enlarge a single figure from a group, otherwise the plate is likely to crack. Another cause of cracking is the too great density of the plate. It is sometimes impossible for the most intense light to act through the whites; in this case it is advisable to make a small, less dense copy, and enlarge from that.

Besides the breaking of the negative, Herr Geldmacher goes on to speak of other disadvantages of heating the negative too strongly by means of the condenser. When a varnished negative is over-heated the varnish burns, and becomes red, brown, and even black, being then perfectly useless; nor can this burnt varnish be removed by washing with alcohol in the usual way. He, therefore, recommends that unvarnished negatives be used. He is also of opinion that its yellow colour allows the varnish to absorb part of the light and to lengthen the exposure. All these evils he has, however, been able to overcome by care, by certain precautions, and by the help of his excellent enlarging apparatus.

The *Monatsblätter* has also an article on a new process for hardening glass by pressure, invented by Herr Siemens, which is now in practical operation at his manufactory at Dresden. Some of our readers may recollect that this process was spoken of in these *Notes* as forthcoming about a year ago; but at that time Herr Siemens had not concluded his experiments. Whether the new toughened glass is destined to be more useful to the photographer than the French variety remains to be learnt, and probably we shall know when the further details, which are promised soon, are published. Meanwhile we do not know whether it can be cracked without falling into a coarse powder, nor whether it is injuriously affected by certain chemicals used in photography, nor whether it can be cut with a diamond, nor, as it is principally manufactured in flat sheets and supposing a satisfactory answer had been got to all the previous conditions, whether it is affected by the light or transmits clearly enough to allow of its being used as negative plates. Of course for baths and bottles, if it were sound in the first two particulars, it would be useful.

Meetings of Societies.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The usual monthly meeting of this Association was held on Thursday, the 31st ult., at the Free Library, William Brown-street,—the Rev. H. J. Palmer, President, in the chair.

The minutes of the previous meeting having been read and passed, some discussion ensued on the difficulties of arranging the excursions so that a larger number of members might be able to avail themselves of them. Nothing definite, however, was arrived at except that it was thought advisable to join the Liverpool Naturalists' Field Club on their various excursions.

The Secretary then read a communication from Mr. H. Houlgrave on *Another Method of Working the Gelatine Process.* [See page 270.] The paper was illustrated by a number of excellent negatives of various subjects taken by the process. In the discussion which followed the Secretary described the various apparatus which Mr. Houlgrave was in the habit of using.

The President said that the members would remember some specimens which he had shown them at a former meeting of the curious effect some gelatine films had upon stripping the dry films from the glass, namely, that the films brought away flakes of glass, making both films and glass useless. He had now to show an ordinary porcelain dish in which some gelatine emulsion had been left to dry. The emulsion had wrinkled up, bringing with it most of the glaze of the porcelain in a most curious manner. The only way he could account for it was the contraction of the gelatine, owing to too high a temperature in drying, as the dish had not been exposed to light in a manner similar to the glass plates. He (the President) believed excessive temperature would be found the great terror of gelatine workers, for many of his failures were solely owing to heat in making his emulsions and plates.

The Secretary observed that Mr. Houlgrave also found that to be the case, his difficulty being to get a very slight heat without the danger of its failing or increasing during his absence. Mr. Houlgrave now used a small spirit lamp, which was perfectly successful. This lamp he had made by inserting a piece of glass tube through the cork of an ounce bottle containing methylated spirit. The tube should be just large enough to hold one thread of cotton wick. A small hole drilled in the top of the bottle admitted air as the spirit became exhausted. Though the flame was so tiny it gave out all the heat that was required, and burned for eight hours with a regularity he was unable to obtain with night-lights, gas, or other means.

Mr. J. H. T. Ellerbeck recommended the use of sponge lamps, which would burn two or three days with as small a flame as might be needed.

Mr. W. H. Kirkby said it had been suggested to him to try the effect of steeping a collodio-emulsion plate in beer previous to developing. He produced a plate, half of which had been treated in that way, the other half without. The teetotal half was a good negative, but the beer had made the film so insensitive where it had been used that only a weak positive could be obtained.

Some views of the wreck of the steamer "Dakota," taken by Mr. W. King, on commercial plates, were exhibited. They were examined with interest; but as negatives they were valueless, being completely covered with opaque spots, evidently the fault of the manufacturer of the plates.

It was proposed that the monthly meetings should be held in July and August, instead of omitting them as heretofore. The decision on this point was postponed till the following meeting.

The meeting was shortly afterwards adjourned until the 28th instant.

THE PHOTOGRAPHIC SECTION OF THE AMERICAN INSTITUTE.

At the April meeting of this body Mr. H. J. Newton, President, occupied the chair.

Mr. Sidney Brown exhibited a number of beautiful coloured photographs painted on glass. Many years ago he had painted what were called "ivorytypes," which he had now improved on as here shown. The colouring is fully under control, and changes can be quite readily made from time to time, should such be desired during the process of finishing. They are oil pictures, painted on the surface, and the cement in which they are imbedded is permanent. They cost $5 for medium or 4·4 bust size, and $10 for full length.

The Secretary said there could be no question about the beauty of the pictures; they were far preferable in appearance to the old ivorytypes. To make the latter artistic skill was necessary, and as the old ivorytype pictures were then being revived the improvement of Mr. Brown would be quite opportune. He had never seen any of the ivorytype pictures that would last ten years.

The President remarked that the handsome specimens which Mr. Brown had shown were, he hoped, but the forerunners of what might be accomplished in the future.

Mr. J. Wood wished to be informed of the best method for keeping a wet plate from drying during long exposures. He could not keep them moist for more than twenty minutes.

Mr. Brown suggested that by placing the plate perfectly level on a table with the face down it could be kept moist for a long time; he had kept the plates so for hours. Glycerine was also successfully used for that purpose. After coating the plate, flow with glycerine, then expose and wash the plate. The glycerine was to be diluted with fifty per cent. of water. Treated in that way he could keep a plate moist for a week or more and the plate lose none of its sensitiveness.

The President remarked that the putting on of glycerine or a solution of glycerine and water removed a portion of the free nitrate, which was essential for the development of the pictures. If, however, a solution of glycerine and water, equal parts, in which from fifteen to twenty grains of free nitrate to the ounce had been dissolved, that objection would be overcome. He (the President) also stated that the collodion film would remain moist a long time if the back of the glass were kept wet. That could be done by laying a piece of wet blotting-paper on the back.

Mr. G. W. Pach said that a very good way to keep plates moist was to place a cup of ice in the camera box; it prevented the evaporation of the solution from the plate. He found the ice much better than a damp towel. He never had a cloud of condensed vapour collect on the lenses.

The Secretary thought that the President's method of using dry plates much to be preferred when the work was to be done some distance off. He had kept plates moist for four hours, but then he had the inside of the camera damp, and the plate-holder padded with eight or ten thicknesses of bibulous paper. Some twenty-five years ago Mr. White, who photographed the White Mountain region, had a method of keeping his plates damp for two or three days by means of wet paper and cloths.

Dr. M. N. Miller inquired what was regarded as the best organifier. He saw it recommended in a photographic journal that, after the plate had been coated with the emulsion, it should be immersed in water until the greasy lines were washed out of it, and then it was to be transferred to the organifier, which consisted of beer and honey. The use of beer for that purpose was well known. His method was to put the plate in a bath or flat dish and wash off the greasy lines; that was all the treatment he gave it. Now with certain emulsions that was successful; but then, again, he had emulsions which seemed to require more organic matter than was found in Croton water.

The President remarked that with some emulsions a plate would not be benefited by washing prior to being treated with organifier. If there were free silver present he would wash it, although Mr. M. Carey Lea succeeded by putting it immediately in the organifier. Now there were as many different ideas in reference to the utility of that method as there were workers. It was very difficult to find two persons who had secured the same results by that method. He found nothing superior to the organifier he published a year or two ago, and that was syrup of squills, nux vomica, and laudanum. One of the best amateur photographers, probably, in the country, Mr. Metcalf, of Milwaukee, who had made as fine work as any he had seen with dry plates, told him he found malt to answer better as an organifier, since the use of beer did not give uniform results.

Dr. D. D. Parmelee said that at the present time there was considerable excitement in the public mind in regard to blue light. He was frequently spoken to on the subject. He believed it to be nothing more than a pleasant shade, and had no peculiar curative property. As there seemed to be some confusion in relation to the purpose for which it was used in the photographic gallery, he would inquire if there was any advantage in having blue light or blue screens over an equal amount of white light.

The President stated that the question of the actinic force of blue light was an unsettled one. Photographers who had experimented with blue glass had so far failed to agree, some asserting that they obtained increased actinic action by its use, while others maintained the opposite opinion. Looking at the question from his standpoint, without having experimented, he should say that the actinism of the solar ray could not be increased by filtering out a portion of it—that the whole was more potent than a part; and, unless it could be shown that there was actually a retarding property or action in some rays of the spectrum, it would be difficult to convince him that there was increased potency in blue when separated from the other components of the white ray. Mr. Gaffield, of the Lennox Glass Works, Mass., had devoted more time and intelligent investigation to the subject than any one he knew of. According to his statement, he had always found coloured light—whether violet, blue, or indigo—less potent in actinic force than white light. He (the President) contended that actinism was a property of light, resident in all the rays, in a graduated scale from violet to red, the force being in the ratio of the wave length.

The Secretary thought that the blue light idea was not all a delusion. He used blue glass to a large extent—probably the largest blue glass light in the city. He found that different shades of it had different qualities. He had five lots of blue glass put up before finding the shade to suit him. A general fault with it was that the tint was too deep a blue, and often upon a green- or orange-tinted glass. He considered a pure white glass flashed with blue—pure blue—very desirable. The light was grateful to the eyes, and a person might sit in a brilliantly-lighted room with blue glass in the windows, and the eyes would not be wearied in the least. He believed the actinic force of the pure blue ray fully equal to the white, and for photographic purposes it had the advantage of making the sitter feel at ease. A subdued blue light produced by frosted glass was far less actinic; he had never seen a frosted glass that was as brilliant. If the colour could be put on very thinly, by a solution that would leave the shade perfect, it would be a great advance. A good blue light could be easily controlled. Mr. Kurtz put blue glass in his gallery some years ago on his (the Secretary's) recommendation, but the improvement was not as he expected; a little more time was required in exposure. On Mr. Kurtz mentioning that to him he visited the gallery, and found that the blue glass was not of the right tint. He had worked considerably with the microscope in artificial light, and found that by using tinted glass very minute tissues could be made out even better than in sunlight. He saw objects that it was impossible to discern without it.

Dr. Parmelee remarked that ladies often told him that their faces became freckled after wearing blue veils.

The President said that Mr. Gaffield did not base any of his assertions on what he believed, but on conclusions which he arrived at after the most careful experiments. The question was not was it a more pleasant light, but whether it was more actinic.

The meeting was then adjourned.

BERLIN PHOTOGRAPHIC SOCIETY.

An ordinary meeting of this Society was held on the 20th April,—Dr. Vogel presiding.

The President read a letter from Herr Suck, of Carlsruhe, concerning the spirit baths recently recommended in the *Mittheilungen* as a preventive of blisters on albumenised paper, in which he said he found the above bath attacked the pictures and altered their tone, and also rendered the paper difficult to handle. He had, however, found that pure alcohol, either concentrated or diluted one-half, acted remarkably well, neither attacking the whites nor changing the tone of the pictures.

Herr SCHAARWÄCHTER said his experience had been similar. The use of a bath of rectified spirit, either concentrated or diluted, had injured the tone and the whites. The cause he supposed to be impurities in the commercial article.

Herr WILDE, of Gorlitz, had for some years been in the habit of adding thirty grammes of alcohol and the same quantity of ether to every litre of his silver positive bath, and had never had blisters since he began the practice.

Herr BERNITZ, of Breslau, communicated by letter two specifics against blisters. The first is the addition of a little alcohol to the fixing bath; the second is a weak alum solution, in which the pictures are laid for a couple of minutes after toning and before fixing.

Herr ROLOFF recollected that when he tried an alum bath the pictures became yellow.

Herr SCHAARWÄCHTER recommended the addition of a little ammonia to the fixing bath.

The CHAIRMAN said he had tried a number of experiments with the mounts complained of by Herr Suck as spoiling the prints mounted on them, by causing the latter to become covered with yellow spots, but he had in no case observed those spots. Some prints he had mounted in December and left lying about where they were exposed to damp and dust were unchanged, as were others purposely mounted with sour paste, while some clean cardboard, saturated at the same time with a one-per-cent. solution of hyposulphite of soda, had only produced one yellow streak on its photograph.

Herr REICHARD suggested that the spots might have been caused by particles of bronzing.

A discussion on backgrounds was the next subject of interest. Herr Klieppel showed three, one being a landscape, all of which were approved.

Herr KLIEPPEL remarked that the same background would often give very different results when placed in different studios. Thus he had a background which had been considered even somewhat dark, yet when it was placed in a certain glass house in Berlin it appeared too light, so that the painter of backgrounds and the photographer who had to use them would require to give each other the benefit of their experience in order to obtain a satisfactory result.

Herr Roloff exhibited some portraits, showing Hartwig's new backgrounds, in which the dark parts appeared as powerful as Seavey's.

Herr Prümm read a passage from a Dresden newspaper announcing the advent of a new method of reproducing oil paintings, called "poikilo photography," the invention of a Herr Schuhmacher, who had recently patented his discovery. As specimens of the process were publicly exhibited in Dresden, Herr Prümm inspected them and felt convinced that, though the reproductions in question gave one a very good idea of the original old paintings, they were produced by no new process, but were merely ordinary silver prints made transparent and coloured from the back, a supplementary colouring being applied to the front when necessary, and an unusually thick varnish film being placed over the whole.

In answer to the question—What transparencies are best suited for production of enlarged negatives?

Herr WILDE said that he had experimented with a collection consisting of the following five sorts:—1. Those produced in the camera and developed with iron. 2. Those similarly produced but developed with pyrogallic acid. 3. Those produced by contact upon a chloride of silver emulsion. 4. Those printed upon carbon tissue. 5. Those printed upon his own bromide of silver emulsion dry plates. He found No. 4 the best and No. 5 the second best.

The question box was then opened, and shortly afterwards the meeting was adjourned.

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Correspondence.

MEETING OF THE PHOTOGRAPHIC SOCIETY OF FRANCE.—A PRIZE OF FIVE HUNDRED FRANCS OFFERED FOR THE BEST-MADE CAMERA.—A SILVER MEDAL FOR A GLASS SUBSTITUTE.—PRESENTATION OF PROOFS.—RECLAMATION OF M. CHARDON.—NOTES ON M. CHARDON'S EMULSION PROCESS.—VOIGTLANDER'S NEW LENS.—A LECTURE BY ALFRED ANGOT.—MY TOUR IN ENGLAND.—MR. HENDERSON'S ENAMELS.—MR. WILLIS'S PLATINUM PROCESS.

THE June meeting of the Photographic Society of France took place on Friday evening last, the 1st inst.,—M. Davanne in the chair.

After the election and presentation of new members, the Chairman rose and said that he was very happy to inform the members that "Le Ministre de l'Instruction Publique" had granted a new prize of five hundred francs, to be awarded in such manner as the Society thought best. The Commission elected by the members was of opinion that the prize should be given in furtherance of scientific photography, and more especially in the aiding of geographical knowledge in newly-explored countries. Although emulsion photography had made rapid strides within the last few months, something was still needed to facilitate operations at a distance from the mother country, and that was a very light, strong, and portable camera with a corresponding stand. Although many cameras and stands had been invented, each having something good, they were, generally, deficient in some respects, and the Commission had decided to offer a prize of five hundred francs (£20) to any manufacturer who presents the best-manufactured camera combining all the required desiderata.

A silver medal will also be offered by the Society to any one who can discover a good substitute for glass in dry-plate work, the object of the Society being to make the weight of *impedimenta* as light as possible for those occupied in scientific photography away from home.

Now I must add that for this silver medal English as well as foreign and home competition is invited. We all know that Mr. Warnerke has made great progress in this branch of photographic industry, as his sensitive negative tissue is all that can be desired for field work; therefore let us hope that he as well as many others will enter into this friendly struggle for fame, and not allow the prize to be borne off without English competition.

M. Jacgar presented a beautiful collection of prints, being reproductions from the pictures in the Stockholm museum. These were very much admired, and they truly deserved to be so, for the workmanship was exquisitely done, and the tones were harmonious and pleasant to the eye.

M. Chardon asked permission to inform the Society that many errors had crept into foreign journals as to the exact proportions given for his new emulsion process, as well as different errors of appreciation. He mentioned the opinion of the Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY in writing on his (M. Chardon's) method of development, in which the Editor supposed that M. Chardon employed the bicarbonate of potash as a developing agent, whereas it was only intended by him to counteract a little acidity in the commercial glucose; in fact, the article, with this exception, he must acknowledge, was ably and intelligently written. "Not so with sundry extracts in the *Photographic News*, which were so badly put together that he would not even give that journal the honour of a refutation."

M. Audra informed the Society that he had succeeded in a very satisfactory manner in making the emulsion according to the formula of M. Chardon, and had obtained several fine negatives, which were passed round for the inspection of the members. I must say, conscientiously, that I have made many experiments with this emulsion, and, whether through bad manipulations or impure chemicals, I have been able to obtain only a very faint image, in which intensification was practically out of the question. M. Chardon has promised to pay me a visit, when he can find a moment's liberty, in order to conduct experiments showing how his emulsion must be made to ensure success. I am, therefore, waiting with impatience in order to be able to say to the readers of this Journal, "do this and you will succeed." M. Chardon has also compiled a new treatise on emulsions, from which I hope to make many extracts for the benefit of emulsion workers. This new book was promised to be ready by the 4th or 5th instant.

I have sent already several specimens of emulsion to M. Chardon, and I must say that, although I have made emulsion for many years, I have never obtained one so fluid and so agreeable to cover a plate as by that gentleman's process; but the drawback is their great slowness. M. Chardon told me that the emulsion was excellent, but slower than that made by himself. Now why is this? All manipulators know that when great success crowns their experiments all goes well, but even a slight want of success makes them more master of their work; so I hope it will be with M. Chardon's process. M. Audra—a gentleman who succeeds very well with this process—came to see me last Saturday, and was kind enough to bring me two prepared plates. They were exposed and gave very fair images, although the time of exposure was slightly longer than with my own dry plates. We then exposed some plates prepared with the emulsion that I had prepared according to M. Chardon's formula; but they required still more exposure. Why was this? In the first place, M. Audra thought the pellicle a little too thin, as they were more transparent than his. We then remarked something very strange, which, perhaps, will be the key to this loss of rapidity, and that was—the two plates which M. Audra brought were a little too large for my camera and had to be cut; these pieces, by accident, were placed in the light among some that had been prepared by me. After thirty minutes my plates had visibly darkened, whereas those prepared by M. Audra had but slightly changed. Now to what cause must that change be attributed? Is it that a large excess of silver was present in the emulsion, and when neutralised by the chloride of cobalt too much chloride of silver was left in the emulsion? That was the question which arose immediately in our minds. The emulsion was then analysed and found to contain a chemical which slightly clouded a solution of nitrate of silver. Whether this product is a bromide or chloride I am at present unable to say, or whether, which is quite possible, it is some foreign salt that the Paris water contained; for I now remember to have washed the emulsion with ordinary water, which was in itself sufficient to account for the slight precipitation of the silver solution. As far as as I can learn at present a slight—but very slight—excess of silver is requisite, this being afterwards neutralised by the chloride of cobalt. Great care must be taken not to have very much of the chloride of silver salts in the emulsion, or there will be a tendency to fog.

M. Carette presented to the Society some new lenses, which the inventor, Herr Voigtlander, calls "Euryscopic lenses," intended for taking groups and landscapes and making reproductions. An important discussion here took place upon the similarity of these lenses to others now in the market. A trial was decided upon and a commission named to make a report upon their value.

M. Alfred Angot gave a very interesting lecture upon the value of photography for astronomical observations, more especially as related to the different studies he had undertaken since his return from his voyage in connection with the transit of Venus. After a very lengthy conversation on what passed during the transit, he brought us back to his late studies, by which he amply proved that the size of the object photographed is smaller or larger according to the length of exposure. In some of the specimens he passed round this difference could easily be perceived by the naked eye. He informed the Society that in a few days a transit of Mercury over the sun would take place, and that he should have something interesting to communicate to the members on that subject. The Society then broke up.

During the last three weeks I have been absent from Paris, making a tour in England, and was agreeably surprised to find such a great number of really scientific men interested in photographic industry. These gentlemen take a pride in saying that it is to photographic and scientific literature, as well as to photographic societies, the immense strides in photographic art may be attributed. In Manchester, Birmingham, Nottingham, Cambridge, and even in some of the small provincial towns, high-class work was to be seen, and bad proofs were an exception. I had the pleasure of visiting Mr. A. L. Henderson, the well-known enameller to the Queen, and was greatly delighted at the beautiful work done by him. So "sure and certain" is he of his process that it appear's child's play to him to convert the positive on collodion into a permanent and beautiful picture. It is not the dusting process on a sugared bichromated surface, but a new process of his own, which he employs, and for the opportunity of seeing the manipulations of which I tender him my best thanks. The Albion Albumenising Company's works were next visited. Not to speak of the very careful manner in which albumenised paper is prepared in that establishment, what interested me most was the working of the new platinotype process of Mr. W. Willis, Jun. This process is now working its way slowly, but surely, in England. The immense advantage, as regards permanence, which it gives, together with the great ease of manipulation, will make it, sooner or later, a favourite process with all. Mr. J. Skinner, the proprietor, showed me many prints, enlargements, &c., made by the process; but I must frankly say that they were inferior to those made in Paris or at Blackpool. I had the pleasure of paying a visit to Mr. Gregson, of the latter town, one of the licencees of the platinum process, and he showed me some beautiful work. The subjects were charming in themselves, testifying to the artistic taste of the artist. Mr. Gregson had discovered a means of giving a brilliancy and soft transparency to these plain paper proofs which were demanded by the public taste of the day, and which will, I am certain, increase the demand for those productions. I must tender my thanks to Mr. Gregson for his kindness in initiating me into the method by which he obtains that soft glaze. I cannot, of course, publish the method; but perhaps, ere long, that gentleman will do so himself.

3, Place Bréda, Paris, June 5, 1877. . E. Stebbing, *Prof.*

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BEECHEY DRY PLATES.

To the Editors.

Gentlemen,—In answer to the inquiries of "A. W. B.," in the last number of The British Journal of Photography, I venture—1. To refer him to the original article in your Almanac, where I recommend no more emulsion to be made at one time than is required for the intended number of plates; any little thick residue is best put into the waste jar. 2. Flocculence is due either to the quality of the gun-cotton used or to the emulsion being too thick. 3. "Immense numbers of minute holes in the shadows and sky" can only arise from dust or careless manipulation. None of the above defects occur in properly-made plates, and when they do occur they are common to every species of emulsion plates with which I am acquainted.

I take this opportunity of saying that I continually receive the highest reports of these plates. I have not had any occasion to alter the original formula; but find that, when made and developed as given in the Almanac, they are capable of the greatest latitude of exposure—from fifteen seconds to three minutes, $\frac{f}{24}$; require no intensifying, no backing, no alcohol in the developer, keep remarkably well, and are subject to no defects which are not common to every other species of dry plates. Their extreme simplicity, their standard quality, and the facility with which they can be made, used, and developed are the constant themes of praise from my several correspondents. I had the pleasure of developing three or four of a batch made by Mr. Rouch, of the Strand, the other day at his house, and which he purposely subjected to the greatest latitude of exposure, and, by varying the developer according to the directions I have given him, all produced good negatives without any flaws or need of intensification.—I am, yours, &c.,

Hilgay Rectory, June 4, 1877. St. Vincent Beechey.

P.S.—I have no interest whatever in their manufacture.—S. V. B.

◆

DURABILITY OF SILVER PRINTS.

To the Editors.

Gentlemen,—In your last week's Journal you expressed a wish that some one should report to you his experience of varnished silver prints.

Now about twelve years ago I did a great many, and I have eight by me now. They are in a *passe-partout*, and have been standing in my waiting-room ever since. They are now as bright and fresh as when first done.

After being rolled they were coated with a solution called "Manson's preparation for dry colours on albumenised paper." They were then tinted with powder colours in a similar manner as glass positives were, and then coated with ordinary negative varnish just the same as varnishing a negative.

From my experience of silver printing I am led to think that there is much more said about fading than is necessary. I believe that if the prints are finished with a moderate amount of care they will be tolerably permanent. I have several dozens by me now that were done in 1862 and 1863. I have taken no care to preserve them, and they have lain one on the top of another on a shelf in my operating-room, not being even covered over. I find they are quite good and brilliant yet. I enclose you three *cartes de visite*—two *plain* and one *enamelled* with gelatine and collodion; and I think you will admit that the enamelled *carte* is quite as brilliant and clean as a newly-finished one. These were all done in 1863. I think that is not bad for silver prints.—I am, yours, &c., R. Clennett.

West Hartlepool, June 1, 1877.

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"IMPURE OXYGEN."

To the Editors.

Gentlemen,—In your impression of last week I notice a letter under the above heading written by Mr. David Young, which, being a deliberate attack upon me, I feel bound to reply to, and trust you will do me the justice to insert the following remarks.

Firstly: Mr. Young asks your readers to divest my apparatus of several of its virtues, and then to compare it with his "patent" apparatus. Very likely if both were melted and run into ingots there would be a similarity, but in their existing form I fail to see any resemblance.

He says my apparatus is an infringement of his "patent" retort in a vertical position. Now I have Mr. Young's specification before me and do not find therein any mention of the retort in a vertical position, and the first intimation of his apparatus in this position is contained in a paper read by him before the Manchester Photographic Society, May 10th, accompanied by a sketch which I consider a poorly-attempted piracy upon my retort, and which I published two months previously. If, as Mr. Young says, my retort is akin to his, pray what relation does his bear to Mr. Noton's original retort?

Mr. Young states that I use in the composition of my cakes three ounces of chlorate and three ounces of manganese. This statement is not correct, as I have generally used four parts of chlorate to one part of manganese, and at present am using cakes six to one. I made one cake of equal proportions by way of experiment, which I cooked before the members of the Manchester Photographic Society, and it was this same cake which I observed was a little damp. The second cake which I cooked (and which was composed of four parts of chlorate to one part of manganese), being perfectly dry, was the one which gave off the gas in one minute and three-quarters, and which was handed round to the members, who acknowledged its hardness and superiority in cleanliness to the method then exhibited by Mr. Young.

The gum water I use—which, in Mr. Young's estimation, seems so detrimental—is ordinary liquid gum, one drop to a cake being capable of producing one cubic foot and a-half of oxygen. If Mr. Young objects so much to the impurity caused by this one drop of gum water, how much more should he object to the use of carburetted hydrogen or coal gas with his *pure* oxygen? My esteemed friend, Mr. John Dale, of this city, has kindly proffered to analyse the gas made from one of my ordinary cakes, but scarcely considers it necessary, as the impurity arising from this small quantity of gum water will be hardly worth mention. Mr. Young states that my cakes are slices of Mr. Noton's plugs, thus, for the first time teaching that a pancake is of the same shape as a rolling-pin, only cut in slices.

Now for his challenge. He says he will have his cases *ready filled* and make eight feet of gas in less time than I can make chlorate into cakes, dry for use, and generate four feet of oxygen; but in a previous portion of his letter he infers that it will take "hours or even days" to dry my cakes. The absurdity of his challenge is therefore apparent. I do not profess to use wet or damp cakes. I always provide an ample supply of dry cakes previous to giving an exhibition, and these are now to be purchased ready for use at a very trifling extra cost to ordinary chlorate and maganese.

In reference to the using up of the spent cakes in the making of new ones: I was asked at the meeting if I could not use them up, and jokingly replied that I would do so when I could not afford to buy manganese. The fact of this being said in joke must be manifest, for if a person cannot afford to buy manganese he can ill afford to pay for chlorate of potash.

I have up to now made few remarks concerning the qualifications of Mr. Young's apparatus; but this much I will state—mine is a *safety* apparatus, and his does not appear to be. My only reason for designing one at all was that I, like many others, did not choose to pay Mr. Young a royalty for the brains and invention of others who, like myself, have given their ideas gratuitously to all who wish to adopt them.

In conclusion: I may say that in this letter I have avoided personalities. I am glad that Mr. Young has sufficient sense to acknowledge the discourtesy of his communication, and regret, with him, his lack of ability. It is a pity that he should from mercenary motives have had recourse to his letter, which only betrays the ignorance and the spirit of the man who wrote it, and which I treat with the contempt it merits.—I am, yours, &c., WILLIAM I. CHADWICK.

Manchester, June 5, 1877.

To the EDITORS.

GENTLEMEN,—Having noticed what is, in my view, an extremely cantankerous communication in your issue of June 1st., by Mr. David Young, I think it only proper to acquaint your readers with some important facts relative to oxygen gas generating apparatus, &c., in order to take the dust out of their eyes, and the fear from their minds of buying or making for themselves unpatented or invalid patent apparatus for generating oxygen.

Mr. Young intimates that Mr. W. I. Chadwick's oxygen apparatus is an infringement of his patent (about the value of which patent I will tell you something presently), and he professes to throw out a friendly caution to your readers and those who deal in and use such apparatus, that they would render themselves liable to unpleasant proceedings. This might be very well for him and his pocket if he could persuade the public to be so blind and timid, and to tremble at his voice and harmless threat.

He asks your readers to divest Mr. W. I. Chadwick's drawings of their disguise in the shape of stand, springs, burner, &c., and to compare the generator proper with his generator. But what would Mr. Young say if we were to ask him to divest his whole apparatus of any of its supposed improvements and to compare it with that of Mr. M. Noton, who exhibited an apparatus so similar in principle long ago at the Manchester Photographic Society (of which both parties are members), and who then and there suggested and explained, long before the date of Mr. Young's patent, how the lanterns could be supported by the gas-holder, &c., &c? Would you or he think this fair?

However, I will endeavour to compare the two generators:—In the one (Chadwick's) the oxygen mixture is placed on a flat plate, and from which the residue can be easily removed. In the other (Young's) the mixture is put into a long cylinder. In Chadwick's the cap is hollow, has an outlet pipe, fits to the bottom by a beveled joint, is *not* held down by a screw, has wooden handles so that it can be charged without burning the fingers, is a safety cover (because it will lift up under excessive pressure), and thus prevents danger of bursting the apparatus, and the gas is taken from the lid. Now Mr. Young's supposed patent does not possess any of these advantages—in short, they are neither alike in design or principle.

Now for the value of his "generator patent." The patent specification I have by me, and I am a little surprised to find that I have very frequently, and for many years, made and sold oxygen generating apparatus of the same kind and on the same principle (which are now in general use) as that claimed in his specification. Any one seeing the two might reasonably conclude that whoever designed the one in the specification might previously have seen the other. The apparatus consists of a retort with a *flange*, as marked "25" in Mr. Young's specification, with a *clip*, as marked "26," which by means of a *screw*, like that marked "31," tightens a *cover*, like that marked "27," upon the end of the retort. Again: there is one thing which Mr. Young seems to think is new and very important, namely, the thin tube as *claimed* by him (see specification lines "42" and "43," page 3), for holding the charge of oxygen mixture. However important it may or may not be it *is not new*, for the reason that the retorts in question, which I long since made, have all got *thin and separate, loose, interior tubes* for holding the oxygen mixture, so that the mixture is prevented from touching the retort proper. I, however, make no pretensions to being the inventor of the apparatus as here described, the same having been suggested to me by one of the partners of a very eminent firm of manufacturing chemists in Manchester, viz., Mr. John Dale, of the firm of Roberts, Dale and Co., Cornbrook Chemical Works.

I have made, and am using, one of Mr. W. I. Chadwick's generators, which acts up to all he has promised in connection with it; and so delighted with it are many of my friends that (being an engineer) they have desired me to make some for them of the same kind, which I am now doing. The cakes of oxygen mixture which I use are made and supplied by Mr. W. I. Chadwick, not in the proportion that Mr. Young states, but are composed of four parts of chlorate of potash and one part of oxide of manganese, and some without and some with a mere trace of weak gum. This gum does not the slightest perceptible harm, as the only product given off with the oxygen is a slight trace of carbonic acid, and this, many of your readers know, is present to a large extent in common house gas, generally used with the oxygen for the lime light.—I am, yours, &c., JOHN CHADWICK,

Prince's Bridge Iron Works,
Manchester, June 5, 1877.
Engineer, and an old Amateur Photographer.

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THE SCHULE MAISTER'S PICTURE.

BY ANE O' HIS SCHOLARS.

TOUCHING. RETOUCHING.

Maister, they've made ye awfu' bonnie
  In this photograph o' yours;
They've ta'en awa a' the bushès like,
  And left naething but the flowers.

A gentle licht gleams frae yer e'e
  In this wee picture here, sir;
A burning fire it oucht to be
  That a' wee fellows fear, sir.

Yer shaggy e'ebrows, tae, they've ta'en,
  And like a barber dressed them;
The thunder o' their gathering's gane.
  As if nae care oppressed them.

And round that mouth o' stern resolve
  They've put a smile sae saft like;
Where ane kens the original
  It looks maist awfu' daft like.

The furrows frae yere cheeks are gane—
  Sa smooth, and saft, and peach-like;
Wi' gentle pressure, and nae cane,
  Would be the way you'd teach like.

We dinna want ye iron'd out
  Just like a white shirt-front, sir;
Leave a' the lines upon yere face
  Tae mak our wee hearts dunt, sir.

Just as it is—it lives wi' us—
  Wi' the wrinkles we'll ne'er part, sir;
When we want to see the bonnie bits
  We'll look doon into yere heart, sir.

MARK OUTE.

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PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The last meeting of this Society for the session will take place on Tuesday next, the 12th inst., at 5A, Pall Mall East, when papers will be read on *Emulsions*, by Mr. Herbert B. Berkeley, and *On the Continuing Action of Light on Pigment Printing*, by Mr. J. R. Sawyer.

PHOTOGRAPHY IN COURT: A FASTIDIOUS UNDERGRADUATE.—At the last sitting of the Clerkenwell County Court the case of Perman *v.* Justin was heard before Judge Whitebread, in which the plaintiff, a photographer carrying on business at Camden-road, sued the defendant, a student at Trinity Hall, Cambridge, to recover, for three dozen *cartes de visite*, the sum of thirty shillings. The plaintiff, for whom Mr. Popham, solicitor, appeared, stated that the defendant, when residing with his father at Camden-road, at one time called on the plaintiff and paid for some photographs of a barmaid residing in the neighbourhood. Subsequently, however, three other ladies brought letters from the younger Justin, who was then at Cambridge, requesting him to take one dozen *cartes* of each. In reply to the judge he said they were different ladies. The judge considered they were taken for some ulterior purpose which it was not for the court to investigate—at all events, the defendant appeared a very fastidious young man. Evidence as to the order and delivery of the goods was given by the plaintiff and his operator. The defendant pleaded minority; but in reply to the court said he had not done so within five clear days of action, and the judge said that plea must therefore be disregarded. The defendant then said he had requested that application for payment should be made to his father, but as the plaintiff had applied in vain to the latter, the defendant was summoned. The father was then called, who said he had been applied to by the plantiff for payment, but at once told him that he refused to pay, as it was most foolish to give credit for articles of vanity, for which no parent could be considered responsible. He further told the plaintiff to sue him in the County Court, where the judge would adjudicate on the matter. The judge said that in this instance, as in many others, it was a pity that tradesmen should give credit to young men for articles not in any way necessary, and, therefore, he should mark his impression of the case by giving judgment in favour of the defendant, allowing him his own costs, including travelling expenses from Cambridge, and also those of his father as a witness.

EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale*, that being done at a small cost in our advertising pages. This portion of our columns is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

Wanted to exchange, a pair of Ross's symmetrical lenses, five inches focus, quite new, for a rapid whole-plate or 10 × 8 doublet.—Address, G. H. Buckman, 23, Albert-road, Dover.

Wanted, Dallmeyer's 8½ × 6½ rapid rectilinear, Ross's No. 1 *carte*, and another maker's cabinet, lenses, also 10 × 8 view and cabinet studio cameras (both swing-backs), in exchange for diamond ring, gold Albert, and photographic apparatus.—Address, Langton, Broadway, South Hackney, London.

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ANSWERS TO CORRESPONDENTS.

Photographs Registered—

W. Sutcliffe, Hollingreave, Burnley.—*Portrait of the Rev. E. C. Maclure.*

William Murray, Liverpool.—Scenes and sketches respectively named as follow:—*An Old Ironclad; A Bridle Scene; Study of a Head; Kid Reviver; Effects of Drunkenness and Vice; Specimen of Rare Old Wedgwood; Portrait of Her Majesty; View of Belfast and Lough; View of the Black Sea and Surrounding Plains; Rejected Addresses; The Rake's Progress, by Hoe G. Earth; Marble Group—the Street Players; Tenor Notes preferred to those of Sims Reeves; Corn Bin—the Horse Fair; Three Celebrated Men (novelist, painter, and poet); A Juvenile Ball; The Parting; Rustic Scene—Woodcutters at Rest; View of the Ruins of China; Fine Group of Bronzes, from a Government Collection; Monuments of Greece; Lay of the Last Minstrel; A Departed Spirit; The Babes in the Wood; The Commentators; Study of Fish; and Lynx in Repose.*

☞ *Correspondents should never write on both sides of the paper.*

Notice.—Each correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a *nom de plume* as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

J. Houghton.—Received. In our next.

Hector.—You will find a full reply to your queries by consulting the advertisements in the present number.

J. A. W.—By the addition of zinc filings, granulated zinc, or silver in a fine state of division, to the collodion the deep red colour will be discharged, but the original sensitiveness will not be restored.

T. H. Hunt.—We altogether disagree with you; for the portion of the negative received by us is very far indeed from being sharp. If it be the best that can be produced by the lens, we advise you to return it to the maker for alteration.

John B. Pratten.—In making a negative bath avoid the use of any of the substances you mention, but confine yourself to a simple solution of nitrate of silver in distilled water. After trying a plate, if there be any indication of fogging add one drop of nitric acid.

S. B. H.—If the portrait enclosed had not been quite so "hard" it would have been an excellent example of successful rapid working. You must use a collodion that gives less intensity, otherwise you must avoid intensifying your negatives quite so much. You are on the fair road to success.

A. L. P.—With a lens having a focus of seven inches it will be requisite, in order to enlarge a picture three times, that the camera be thirty-nine inches in length; because with a lens of such a focus the distance between the sensitive plate and the lens is twenty-eight inches, while that between the lens and the negative to be enlarged must be over nine inches.

Geo. Brown.—The following directions will enable you to succeed:—Soak the gelatine in water for an hour and a-half or two hours, and then dissolve. Now add the requisite quantity of the bromides of ammonium or cadmium previously dissolved in warm water. The silver is next added, proper precautions being taken to ensure its being well mixed with the bromide.

W. R. Suttie.—If carefully kept the ordinary sensitised paper now so generally sold will retain its printing qualities for many months. About a week ago Mr. Werge showed us a print upon a sheet which had been sensitised—or, perhaps, more correctly, sold—by him ten months previous to its exposure in the printing-frame, and there was such a degree of freshness about it that it compared most favourably with a print produced upon paper which had been sensitised only the same morning.

Carboniensis.—The acetate toning bath we employed in the production of the prints to which reference is made is composed in the following proportions:—

Chloride of gold	1 grain.
Acetate of soda	30 grains.
Water	1 ounce.

Let it be prepared for at least one day before it is to be used.

W. H. H.—One of the most convenient kinds of developing-tray, by which to ensure the utmost possible lightness and facility of repairing if damaged, is a light wooden dish formed of a porous, absorbent wood, the edges being glued on by means of a thick solution of shellac. When completed, coat it well with a thin alcoholic solution of lac, repeating this application until it ceases to be absorbed and dries with a hard surface. A final coating of thick spirit varnish completes the operation. Well-varnished gutta-percha trays also answer very well for developing. But a great variety in the way of material might be suggested for this purpose, including ebonite, millboard, *papier maché*, and many others.

W. Mathews (The Royal Fort, Bristol).—Under the heading of "Curious Spectroscopic Discovery" Mr. Mathews sends us a letter announcing his discovery of a certain alleged *stereoscopic* (not "spectroscopic") effect. As it is a mere transcription of a letter that appeared in the *Builder* last week, and upon which we had written an article to be found in another column, previous to our receiving the present communication, there is no necessity for our republishing it, inasmuch as we have in our article given the gist of Mr. Mathews' letter. One application of the so-called discovery we may here give, and we extract it from the letter in question:—"I conclude [says the writer] by observing that I have placed in this apparatus—which, for lack of any better term, I designate an 'Identiscope'—certain life-size photographs, being, on the one hand, those of the 'young Roger Tichborne,' and on the other those of the 'Tichborne Claimant.' Doubtless I shall be expected to state the result of a test so conclusive. But, though the reply may be given with the utmost certainty, it is a disclosure which I do not here deem it needful to insert on merely my own unsupported authority."

Received.—John Nicol, Ph.D. In our next.—*Street Life in London.* Part 5. This illustrated serial is still as energetically conducted as ever. It contains three illustrations of scenes in London street life, with appropriate descriptive matter.

☞ **Editorial Communications should be addressed to "THE EDITORS"—Advertisements and Business Letters to "THE PUBLISHER"—at the Offices, 2, York Street, Covent Garden, London, W.C.**

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Robbery by a Brother at Didsbury.—At the County Police Court, Manchester, on Monday last, the 4th inst., before Sir John Iles Mantell and Mr. T. Dickens, Henry Turner, photographic printer, was charged with breaking into the house of his brother, Edward James Turner, photographic artist, Didsbury, and stealing therefrom a quantity of wearing apparel and other articles, valued at £5. The robbery was committed on Saturday night, and the prisoner was apprehended at Higher Broughton on Sunday last. Some time ago he was imprisoned for two months for embezzlement, and until within the last few weeks he had resided with his brother at Didsbury.—The prosecutor asked the magistrates to deal with the prisoner leniently, and he was sent to gaol for three months.

Carbon Printing in Relation to a late Controversy.—We have been favoured by the Autotype Company with an opportunity of examining a series of carbon pictures printed by Sir Thomas Parkyns from one of his own excellent negatives. The special feature in these prints lies in the fact that of the twelve specimens now before us no two are alike, all being printed with different shades of carbon tissue, representing, indeed, most of the various tints manufactured by the Company. These comprise browns, purples, and blacks in several grades of tints, even if not of different *colours*. Among them are three specially made for Lambertype licencees, the brilliancy of which is most undoubted. We have been requested to state whether we can discover any similarity, or rather any phases of difference, between those prints produced by what is termed the special Lambert tissue and that ordinarily sold to carbon licencees. There is, undoubtedly, such a measure of difference between these as to render it a matter of the utmost ease to distinguish between them. It will afford us pleasure to show this interesting collection to any who will call at our Publishing Office.

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METEOROLOGICAL REPORT.

Observations taken at 406, Strand, by J. H. Steward, Optician.
For the Week ending June 6, 1877.
These Observations are Taken at 8.30 a.m.

May.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks
31	29·59	SE	54	58	63	48	Cloudy
June.							
1	29·44	S	53	56	59	55	Raining
2	29·89	SW	52	55	65	52	Dull
4	29·79	SW	56	60	82	55	Hazy
5	29·94	W	53	59	70	54	Cloudy
6	30·06	SW	52	60	—	49	Fine

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 893. Vol. XXIV.—JUNE 15, 1877.

ON WASHING EMULSIONS BY PRECIPITATION.

In another column will be found a communication from Mr. M. Carey Lea upon the above subject, in the course of which that gentleman calls in question the remarks we recently made in connection with M. Chardon's process, which he believes to be only a copy of his own.

In making a few further remarks on this subject it is our opinion that the merest glance at the details of the two methods will reveal the fact that, beyond the adoption of the principle of precipitation in both cases, the two processes have not a feature in common. We shall have something to say later with regard to the effect of these variations upon the result of precipitation. Mr. Lea states in the course of his article that M. Chardon's process, or rather that portion of it involving the precipitation, was published as new—"a claim in which, considerably to my surprise, the Editors of this Journal seem to support him."

To this we can only reply that M. Chardon's method was *not* published as new, and, therefore, we could not support him in any such claim. M. Chardon himself expressly stated that he claimed nothing new, and we believe we correctly described the process as combining "*the results of several years' experiments, with the latest improvements introduced by other workers in emulsion photography.*"

The principal, if not only, novelty in the method which was claimed, not by M. Chardon himself, but by ourselves on his behalf, was, as we very explicitly stated, the use of precipitated pyroxyline, which, in addition to other advantages, we stated reduced the precipitation of the emulsion to a certainty, whereas it had hitherto been a matter of some doubt. So far there is no claim made in favour of M. Chardon's as distinguished from Mr. Lea's mode of precipitation, but later on we stated our belief that the employment of precipitated cotton appeared "to remove the uncertainty which attaches to Mr. Lea's process," &c., speaking of Mr. Lea's process as representing the *principle of precipitation.*

As regards this uncertainty—which Mr. Lea, however, does not of course experience—we may say a word or two. It is quite possible that the employment of a special sample of pyroxyline may be necessary in order to bring about an entirely successful result, and though Mr. Lea may be favourably placed in this respect, our own experience (in which we are supported by several emulsion workers of many years' standing), is that with the most suitable pyroxyline obtainable *here* the very greatest care is necessary even when using Mr. Lea's own formula.

We come now to the most important element in the discussion, and which Mr. Lea seems to have overlooked, namely, the radical difference as regards details between his own method and that of M. Chardon. Setting on one side minor differences, the former consists of an emulsion containing a large excess of silver; the latter, on the contrary, an excess of soluble bromide. In the former case the precipitation is performed by means of an organifier composed of gum, albumen, tannin, and other substances, which, we are in a position to say, affect very materially the state of the precipitate; while in the latter case water alone is the agent employed. These two points are, as we shall show presently, fully sufficient to account for a very great difference in the behaviour of the emulsions under otherwise similar conditions, and indeed to necessitate, perhaps, an entire change of treatment in order to produce the best results. We may conclude this explanation by saying that we have used Mr. M. Carey Lea's process pure and simple, and have succeeded. We have employed M. Chardon's method, and have also succeeded. We have precipitated emulsions containing excess of bromide by adding water to the emulsion, and *vice versâ*, and prefer the latter. Both methods fail sometimes, and where only one succeeds it is the latter. Finally, in Mr. Lea's process his own mode of precipitation is no doubt the better, and we have no fault to find therewith, but when the conditions under which the precipitation is performed are so materially altered as in M. Chardon's process, we find a different course preferable. We have been in the habit of speaking of "Mr. M. Carey Lea's process" as representing the principle of precipitated emulsion, and this may have led Mr. Lea to think himself slighted in this matter, otherwise we think he would scarcely have found groundwork in M. Chardon's process upon which to base his present complaint.

Since reading Mr. Lea's communication we have carefully repeated the experiments necessary for a comparison of the two methods of precipitation with emulsions containing respectively excess of silver and of soluble bromide, using both water and an organifying solution as directed in Mr. Lea's instructions. Portions of an emulsion which we had ready for pouring out, prepared by our usual working formula, which provides for a very slight excess of bromide, were treated—first, by the addition of water as recommended by Mr. Lea; second, by pouring into water as directed by M. Chardon; third, by the addition of an organifier consisting of coffee and gallic acid; and, fourth, by pouring the emulsion into the same. Another emulsion prepared with but slight variation according to Mr. Lea's formula, and calculated to contain the same excess of silver, was divided into four portions and treated in the same manner.

In consequence of the limited time we have had to devote to these experiments we can speak as yet only of their behaviour in the process of precipitation, and this must be also our excuse for not following to the letter the formula laid down by Mr. Lea for working his process; but we opine that the conditions are sufficiently near to render any very great deviation in result out of the question. It should be stated that the emulsions were both prepared from ordinary pyroxyline (Rouch's) and not from a precipitated sample.

The results of the precipitation may be briefly stated as follow:—In the first case, as the water was poured in the whole at first formed a homogeneous mixture; but, after stirring for a couple of minutes, a slight scum rose to the surface when the mixture was allowed to rest, the bulk of the emulsion being apparently held in suspension in a state of tolerably fine division, showing little tendency to deposit. The next result was better, for the emulsion, upon coming in contact with the water, was immediately solidified into tufts or "strings," a small portion only mixing with the water, and this, when the stirring was discontinued, settling to the bottom of the vessel in coarse grains. No. 3 produced a larger quantity of flocculent scum than was obtained with the first lot, and was similar in general character, though slightly firmer in texture. A considerable precipitate was also formed at the same time. With the last sample a result almost identical with No. 2 ensued, but the precipitate was greater in quantity and finer in character.

With the four portions of emulsion containing excess of silver the results were different. No. 1 gave a considerable quantity of precipitate of a dirty colour, unlike the pure yellow of the ordinary pellicle, and a slight scum of the same tint. No. 2 gave a preponderance of floating, stringy matter and a minimum of precipitate, both of which exhibited the same peculiarity of colour as the last named. No. 3 of this series, which we may take as representing Mr. Lea's own process, gave a copious precipitate of a coarse, granular character, but not "stringy," and after allowing some time for the precipitate to subside the supernatant liquid had a muddy appearance, as if containing fine particles of emulsion in suspension, but in so fine a state as to pass easily through ordinary filter-paper. In colour the product of this experiment was darker than that obtained from the emulsion with bromide in excess, having a slightly brown tinge, but none of the dirty look mentioned in connection with the first two of this series. The fourth product partook of the characteristics of the other products obtained by *pouring* the emulsion, almost the whole of the pellicle being formed at the surface of the liquid; in colour it was identical with the last named.

We enter thus minutely into the particulars of the various products in order to show where lies the difference between the two methods of precipitation. Upon comparing them it will be seen that, by pouring the water (or organifier) into the emulsion, the tendency is to form a precipitate of greater specific gravity than the liquid. When the opposite conditions are observed the product is lighter in character—in some cases spongy or stringy, while in others it forms nothing but a thoroughly disintegrated scum. The action of the organifier, especially in the presence of free silver, is very marked even in modifying the physical character of the product; and we anticipate that, upon further trying the redissolved pellicles, its chemical effect will be quite as great.

There is one point in Mr. Lea's article which deserves some notice, namely, his experience with the two distinct products formed. On the score of convenience in washing and collection he gives the preference to the heavier form, which may be washed by decantation with the greatest ease if it be sufficiently solid and settle rapidly to the bottom of the vessel; the scum, on the contrary, almost baffles all treatment. In following his mode of precipitation the result is, as he states, a solid and easily-collected precipitate; but we do not follow him in his description of the product obtained by the other method. This, if properly carried out, results in a product which is more easily washed and collected than even the solid precipitate; it consists, or should consist, of a firm, spongy mass, made up of innumerable minute filaments of precipitated emulsion, which may be lifted from one vessel to another with the greatest ease by means of a glass rod. When stirred it separates into small particles, which again collect in a mass on the surface when allowed to rest. In order to obtain this result it is only necessary to pour the emulsion *slowly* into a *large* quantity of water; if too little water be used the product partakes more or less of the character of a "scum." Variations in the nature of the pyroxyline will, no doubt, modify the result.

In conclusion: it is unnecessary for us to repeat that in any remarks we have made we entirely disclaim all intention of injustice to Mr. Lea. In treating M. Chardon's process we looked upon and spoke of it as entirely differing both in detail and in principle from Mr. Lea's, and have endeavoured to explain our reasons therefor.

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OYSTER-SHELL MARKINGS ON WET COLLODION PLATES.

Although the subject brought forward for discussion at the last meeting of the South London Photographic Society was the now well-worn one of the negative nitrate bath, one of the members present had the tact to divert the discussion from the interminable pinhole grievance, about which so much has recently been said, into another channel, and thus led to the ventilation of a subject the discussion of which will, we feel assured, prove useful and interesting, and be welcomed by a large number of practical photographers.

During the cool winter months very little is heard of mat stains and "oyster-shell" markings upon the plate, for both of these terms are employed to designate the "seasonable" grievance to which we have alluded. Scarcely, however, does the hot weather set in before complaints invariably reach us of the tendency of the film to become dense in sundry irregular patches, owing to an abnormal deposit of silver of an altogether different nature from that by which the proper image is formed. The latter is occasioned by a reduction of silver within the film; in the case of the former the silver is reduced upon the surface. In the one case the reduced silver is so much a "part and parcel" of the film as to render impossible its removal by any but chemical agency; in the other it lies so loosely upon the surface as in most instances to render its removal quite easy, even when wet, by means of slight friction with a tuft of soft cotton wool.

The shape assumed by these surface stains is of the most varied and, frequently, whimsical character. But as their fantastic forms are probably familiar to every reader we need not attempt to describe them. Their production is favoured by a hot, dry atmosphere, especially when a hard and horny sample of collodion is employed.

There are several causes which conduce to the formation of these markings, and previous to describing the best ascertained of such causes we may dismiss, as quite untenable, an idea which at one time was firmly held by many, namely, that they arose from the presence of methylated alcohol and ether in the collodion. This we have found, from a number of experiments, *not* to be the cause of such markings; and we may here observe, incidentally, that the worst experience we have ever had of these "oyster-shell" markings was when we were making use of a certain commercial collodion, one leading feature of which is that it is prepared with the purest non-methylated solvents.

But although the purity of the solvents has nothing to do with the formation of surface markings, the nature of the pyroxyline in the collodion must be held as mainly responsible for such defects. Where the collodion is hard and of a non-porous description, giving a film of a skinny character, if a plate be coated with such a preparation and, after being sensitised, be placed in the dark slide and allowed to remain there for six or eight minutes, it will be found upon examination that, near the lower margin of such plate, the silver will have accumulated in patches—the result of the drainage from the surface. If the examination be made by yellow light, and the form and position of these patches of accumulated drainings be carefully noted, the plate being afterwards exposed in the camera and developed, it will be found that all the drainage patches that were previously observed will, upon the application of the developer, become developed into well-defined stains. This was recently our experience when using a new collodion of the kind described; upon substituting for it a fine sample of very old and porous collodion the drainings ceased to accumulate in these forms, and surface stains disappeared.

A perfect remedy for the evil complained of is to be found in the employment of a collodion of a non-contractile character and in allowing the plate sufficient time to drain. There are few photographers who have not close at hand a quantity of old "rotten" collodion; we have found that the addition of some of this to a new sample will frequently cure the tendency of the latter to produce the defects in question. Many photographers of experience, not having such a sample of old collodion within reach, prefer to induce the requisite physical structure in the film by adding one or more drops of water to each ounce of the horny collodion. In most cases this will effect a complete cure, especially if the plate be well drained before placing it in the camera slide.

Here we may observe that, by placing a slip of blotting-paper in each corner of the dark slide, so as to prevent the surface of the plate from coming in contact with the wooden corners, and also ensure the absorption of all the silver that drains down, no markings will be produced; for it is obvious that if the surface stains are caused by the accumulation of the drainings at the end of the plate, the removal or prevention of the accumulation of such drainage by means of blotting-paper placed at the corner will secure immunity from these markings.

It is an objection to the long draining of a plate that the upper end sometimes becomes dry before the draining has been as thoroughly effected as is considered desirable. In this connection we desire to recal to the recollection of our readers the description of a large oscillating well-bath, introduced by Mr. H. J. Burton, and exhibited by him at the Technical Exhibition of the South London Photographic Society in 1874. This bath was formed of a flat dish with a deep well at one end, and it was mounted in a wooden frame of such a construction as to allow of the collodionised plates being placed in it while the frame was raised at a considerable slope at one end, a tight cover being then placed upon the case, after which it was gently laid in a horizontal position, by which the silver solution in the well immediately flowed over the surface of the plate. After being thus sensitised the bath was again tilted up to its sloping position, by which the most perfect drainage of the collodionised surface was allowed to take place in a moist atmosphere and in total darkness.

At the last meeting of the South London Photographic Society—as will be seen from our report in another page—Mr. E. W. Foxlee exhibited a modification of this form of draining bath, in which, he said, a plate might be allowed to drain for hours if necessary without becoming dry. By making use of a bath of this kind Mr. Foxlee said that the production of oyster-shell or other surface markings was rendered impossible.

SHELLAC, AND ITS USE IN VARNISHES.

In the earlier days of photography formulæ of a simple nature were of comparatively rare occurrence, the empirical compounders of such recipes as were in vogue usually considering it necessary to mystify them by the addition of inert or useless ingredients to a considerable extent. Nowadays, however, there is happily a greater tendency to use only the smallest number of ingredients possible in any photographic mixture, and each item has to stand the fire of criticism as to its claim for admittance. In varnish making, at least, this tendency to simplicity has had advantageous results. It is true large dealers have taken up the manufacture, many of them being able to supply varnish, whose composition can only be guessed at, of the highest excellence; still, among those who make their own supply, preference is no longer so much given to the old messy mixtures.

The substance which gives the title to our article is a case which will illustrate the point. Shellac, seedlac, sticklac, together with benzoin, sandarac, juniper, oil of lavender, &c., &c., were no uncommon ingredients in one and the same varnish among those in use a dozen years ago—good and serviceable enough, no doubt; yet it is certain that no advantage is to be obtained from using, for example, all those varieties of lac mentioned, for the resinous material which gives value to them is the same in each. "Sticklac" is the name given to the twigs as they are gathered covered over with the secretion or deposit which, after sundry manipulations, is made into the other forms named. One very plausible theory as to the origin of these deposits is that they are the aggregated remains of the bodies of insects left after egg-depositing—an act of maternal self-immolation to form food for the future larva. Whatever their origin, they form an item of great importance in Eastern exports for the shellac and lac dye obtained. Seedlac is simply the deposit separated from the encrusted twigs or sticks, and has obviously gained its appellation from the resemblance the separated particles bear to small seeds. After lac dye is obtained from the seedlac the resin left behind is melted, strained, and then spread over a metal cylinder or plate in thin layers, and upon cooling is separated in thin, flat flakes of various sizes; hence the name *shell*-lac. According to the quality of the product of this final process, depending mainly upon the thoroughness with which the dye is removed, the article receives various descriptive distinguishing titles. Thus: liver, garnett, and orange lac (the latter, again, of various grades of excellence) tell at once the colours of the respective samples which bear these names, and for photographic varnish-making none but the very best and finest picked orange should be used.

It was seen early in the use of shellac that if it were bleached its appearance would be very much improved and its usefulness increased, and a method of treating it with animal charcoal was adopted, afterwards to be followed by a much quicker process—treating with alkali and water till dissolved, and then precipitating with chlorine in some form. This latter method of bleaching lac is carried on at the present day, the pasty magma obtained being repeatedly drawn out till it forms coherent and portable sticks about an inch thick and twelve or eighteen inches long, in which form it is brought to market.

We believe we are right in stating that it was for the purpose of sealing-wax manufacture that the bleaching of shellac was originally attempted; and, when first the idea of utilising it for varnish was essayed in practice, failure was the result—from a cause now well enough known in many quarters, yet sufficiently unknown among photographers to bear repeating once more. When bleached shellac has been kept a certain time—particularly if exposed to the air—it becomes perfectly insoluble in alcohol, no amount of heating or repeated agitation being able to cause the spirit to take up the slightest quantity of the material, and until it has been subjected once again to the bleaching process it is useless as an ingredient for varnish. If properly stored, however, it may be preserved many months without danger of insolubility setting in, the best method of keeping it being to place it in a vessel in some cool, dark place, and keep it covered over with water. To the experienced hand this insoluble modification of white shellac can be judged by inspection, a stick broken across generally showing a thin coating of a more translucent appearance than the inner parts, and the whole mass presenting altogether a yellower appearance than in the soluble samples. The addition of oil of lavender to the solvent, which often has such an effect—almost magical—in aiding solution, is here of no avail; and camphor—also at times a most useful aid to the solution of gums—has no effect.

Bleached lac has for a long time been a favourite, and, indeed, the leading basis in the published formulæ for photographic varnishes; but its use is attended with many grave disadvantages. In the first place, the chlorine seems to have the effect of destroying many of its good properties, a plain alcoholic solution of bleached lac being much inferior in durability, tenacity, and hardness to one of ordinary orange lac; and it is further worthy of note that the chlorine is rarely, if ever, entirely eradicated, and so there are always left in the negative varnished with such a substance traces of a destructive agent which at any time may prove disastrous to the durability of the film.

Many other processes of decolorisation have been proposed, but are not known to have been pursued in practice; but we are strongly of opinion that some of the well-known negative varnishes sold by the dealers have not been made from shellac bleached by chlorine. There has thus arisen a constantly-increasing distaste to the use of bleached lac among photographers, and many attempts have been made to supersede it by some other material; but, somehow or other, no substitute yet proposed has been found quite to equal it.

With this object in view the unbleached shellac has been frequently tried, and by some with success, while others have not cared to continue its use. The chief defect in this varnish is the very dark and adiactinic quality of the coating it gives, and no means of a practically satisfactory nature have been made public that would render possible the discharge of the colour from alcoholic solutions of the lac. We have ourselves often used the best orange shellac in simple solutions in methylated spirit, and found it to give a hard and serviceable coating. Simple solution of lac has the drawback, apart from its colour, of giving a film which close inspection shows to be not perfectly smooth and glossy, innumerable excessively-minute ridges running from end to end of the plate, and these, it is reasonable to suppose, might result in future cracks. Fortunately, however, this can be remedied by the addition of another gum to the solution, an addition of ten per cent. of sandarac sufficing to give a beautifully glossy, even film, tenacious and hard. We are acquainted with a professional photographer who has been using this varnish for some time past. He tells us he had about two thousand negatives varnished with it, and they all appear perfect; he does not find the slightest disadvantage in the deep colour, the "slowing" in printing being quite imperceptible.

Shellac is soluble in a solution of borax, and, like some other resins treated with the alkalies, possesses the property of being altered by ammonia. When allowed to soak for some time in a strong solution of carbonate of ammonia it becomes afterwards soluble by long-continued boiling with water. It differs, however, in this respect from other resins—that further additions of the ammonia do not interfere with the solution, while in the case of copal, for instance, the soluble compound with alkali is insoluble in boiling water containing free alkali.

This property has been of little practical service in photography, the impervious coating of the single transfer-paper in the carbon process given by the aid of such solutions being almost the only use it has been put to. The method of Mr. G. Watmough Webster of rendering alcoholic solutions of lac soluble by the addition of a small quantity of strong ammonia solution is also serviceable in the case of a doubtful negative. When any risk of splitting upon drying is anticipated the shellac varnish so modified may be poured upon the film while still damp, and the danger be thus warded off.

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We last week devoted an article to the subject of halation, selecting as our text that form of the defect arising, as is generally supposed, from the lateral spreading within the film of the action of development. Let us now turn to the form once most prevalent, but of which we now hear less—probably owing to the general adoption of films which are less liable to its production—commonly known as "blurring," and caused by the reflection of the rays of light from the back surface of the glass. This form occurs with more or less force in proportion to the *transparency* (not necessarily the thinness) of the film, and is almost, if not quite, unknown in connection with wet plates. It was first brought into prominent notice when the thin, transparent films obtained by the tannin process came into vogue, and numerous expedients have been introduced for its prevention. These, though not entailing much trouble when a few plates only require to be treated, prove a serious addition to labour accompanying the preparation of a large batch of plates for a tour of some duration; and as at the present season most of our readers are, in all probability, contemplating a holiday "outing," it may be worth while to point out one description of plate which renders all anti-blurring treatment unnecessary. We allude to the plates prepared by any of the washed emulsion processes, which, upon examination, will be found to differ, physically, in one respect from all others in whose preparation a preservative is used. It is generally, if not always, the case with the latter plates that the films upon drying become thinner and more transparent, while with those prepared from a washed emulsion the exact converse happens, for they become denser and more opaque. Though the films may be thin the atoms composing them lose their transparency on drying, and thus prevent the passage of the rays to the back surface more readily than when the pores of the collodion are filled with a gummy preservative. We recently obtained upon these plates, and without any "backing," some negatives of a view including a windmill with the sails furled, which show the framework of the sails and even the ropes clearly outlined against the sky, though the ropes are so minute as to be scarcely visible without the aid of a magnifier.

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PRECIPITATING EMULSIONS.

About a year since, or rather more, I found a method of precipitating sensitised emulsions, instead of pouring them out and letting set. This mode of operating seemed to be useful and convenient by saving some trouble and yielding a more manageable product, and I therefore sent it to you. The Editors did not seem to take to it very kindly; I think it was even said in your columns that it would not work. It proves, however, to be an improvement, and now another claimant appears for it, whose first connection with the method dates long after its publication by me.

It is evident that the precipitation of an emulsion by water (or by a preservative bath) may be managed in either of two ways—by pouring the water into the emulsion, or the emulsion into the water. At the time when I speak of it had been already found that the loss, when plain collodion was poured into water, was very large. M. Camuset had stated it at about one-half, and in an experiment made by myself the loss amounted to forty-seven per cent. This, it will be observed, was with simple collodion, not with an emulsion. The reverse operation—pouring water into collodion—had never been tried.

At the outset of my experiments it occurred to me that there would be a great advantage in pouring the water or bath into the collodion—that the product would be more massed together, and there would be less loss. Experiment fully confirmed this view; it was found by repeated weighings that a given quantity of emulsion yielded as much dry pellicle as when allowed to set before washing. In publishing the process, therefore, early last year I strongly recommended that this course should be followed, and my experience since has entirely confirmed this view.

Recently a French photographer, M. Chardon, has published the reverse method as new—a claim in which, considerably to my surprise, the Editors of this Journal seem to support him. It is quite legitimate for M. Chardon, if he see fit, to disagree with me, and to prefer the reverse method, but that preference is certainly no discovery. Moreover, that preference is, in my opinion, erroneous. As to what results my method is capable of giving, it is sufficient for me to refer to the testimony of Mr. Alexander Henderson, of Montreal, published in the last British Journal Photographic Almanac.

I have not thought it necessary to repeat my comparative trials since reading M. Chardon's process, for I had already completely made out the relative merits of the two methods, and, to make the matter very clear, I will state them here.

Either method will give a very sensitive tissue. They are so nearly alike in principle that this could scarcely be otherwise. But the mechanical condition of the precipitated mass is very different in the two cases. When the emulsion is first poured into the glass vessel (as I have recommended), and the water, or bath, is gradually poured into it, with active stirring, the two liquids at first mix, but in a few moments one feels that the rod begins to carry round something solid with it. This solid matter rapidly increases in amount, and settles to the bottom. The subsequent washing operations are carried on with the utmost ease. After being stirred up the precipitated pellicle rapidly and quickly falls to the bottom, and the water can be easily and safely decanted. The pellicle when dry is fibrous and stringy.

When the operation is reversed, and the emulsion is poured into the water or bath, the action is somewhat different. The precipitated matter is much less fibrous and more granular, is consequently more divided, and is more difficult to wash and more is lost. Besides, it frequently shows a more disagreeable disposition to divide into two portions—one heavier, and one lighter than the water—one falling, the other rising like scum. When this is the case (as it generally is) the washing becomes extremely disagreeable and troublesome. With each attempt to decant, the portion on the surface (and I have seen this amount to three-fourths of the whole) goes over with the water.

One puts a cloth over the vessel, and finds this perhaps some help; but the fine particles of precipitated pellicle adhere to the cloth and have to be removed from the cloth at every washing. I found it better to remove the scummy part with the fingers, and wash it in a separate vessel throughout. This, of course, doubled the trouble; and I also estimated the loss in the way of operating to be one-sixth greater, or even rather more.

All the trouble is avoided by using the plan which I recommend. The precipitated pellicle is then fibrous enough to mat a little together—not enough to impede the washing in the slightest degree; on the contrary, the washing is greatly facilitated.

Whichever mode is adopted the dried pellicle dissolves with the utmost facility in the mixed ether and alcohol; in either case far more easily than when the emulsion is poured out and let to set. The advantage, then, of the method of precipitation over the method of letting set are that it gives somewhat less trouble, and yields a more soluble product. When the precipitation is effected by pouring the bath or water into the emulsion, the dried product does not differ sensibly in amount from that which is obtained by the process in which the emulsion is let to set. When the operation is reversed the loss is materially greater.

M. Carey Lea.

PHOTOGRAPHY AT THE WAR.

By the Artist of the London Stereoscopic Company.

It required some consideration as to what was to be the best form of apparatus to take out on this visit to the East. After a consultation with the head of the department at Woolwich it was decided that a camera that would swing both ways, fitted with the roller dark slide, would be the best, and Warnerke's sensitive negative tissue (glass plates being, as may be imagined, out of the question), lens No. 1a rectilinear, and also 6 × 5 rapid. These two, of course, can be used as four lenses. It was also decided that no chemicals should be taken. A Kennett's stand was packed, but I regret to say that it does not answer here. The wood of which it is composed has got so much out of shape that it is quite impossible to open it; something lighter, I am sure, would answer better.

I took some instantaneous photographs at Naples on the ship. I cannot at present tell how they will turn out. I also took some when the ship was in motion. All were with the rapid rectilinear lens. Mr. Warnerke has kindly undertaken the development of the pictures, and I shall be most happy to give the result.

The weather is beautiful, but very hot. The only objection I have to Constantinople is there being so many objects of interest that one does not know where first to commence with the camera.

I may add that the whole apparatus is carried in a bag, and hung over the shoulder like an opera glass. Its weight is about six pounds for 7 × 5 pictures. In my next I shall be able to tell how I get on in the field.

Pera, the 1st *Monday in June*, 1877.

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THE NITRATE OF SILVER BATH.

[A communication to the South London Photographic Society.]

I make no apology for calling your attention this evening to the old, well-worn subject of the nitrate of silver bath. From the first introduction of the collodion process the bath has been to photographers a subject of the deepest interest and often of the greatest anxiety. A good working bath and one that can always be depended upon is a source of joy and satisfaction to the conscientious operator, while a bath that is always getting out of order is a constant source of trouble and annoyance.

Until the happy time arrives when the photographer shall be able to dispense altogether with the silver bath as an essential part of the collodion process—and looking at the rapid strides made by emulsion processes the time may come sooner than we now expect or hope—the question of how to keep the silver bath in perfect working order is one which demands and deserves the most careful consideration.

If we consider for a moment the nature of the reaction which takes place when a plate coated with iodised collodion is immersed in the silver solution, we shall at once understand why it is that a silver bath in constant use so often fails to give satisfactory results. With each plate immersed a change takes place in the relative proportions of the materials of which the bath is composed.

A bath of pure silver and pure water will give, perhaps, the most perfect results it is possible to obtain; and with such a bath all will go well up to a certain point, after which deterioration, more or less rapid, sets in, and the bath eventually becomes unfit for work. For this reason constant efforts have been made to discover some substance which, when added to the solution of silver, would have the effect of keeping the same in working order, or restoring it when contaminated by the unavoidable introduction of foreign and injurious substances.

Many things widely differing in character have been proposed and more or less successfully used for the above purpose; among others, I may mention nitric acid—at one time the panacea for all the ills the bath is afflicted with. Cyanide of potassium was suggested by Mr. Tully ten years ago, and has been lately strongly recommended by others who have tried this method. Nitrate of iron has been recently suggested by Mr. A. L. Henderson, who has also used and strongly recommended nitrate of baryta as an addition to the bath; and, lastly, we are advised to try an addition of a little hyposulphite of soda.

I do not propose in this paper to discuss the relative merits of the various remedies I have just alluded to—and most of which, except the last, I have carefully tried—but will at once describe my method of making and treating the nitrate bath. I do not claim the plan of working as a startling novelty, but it is one which, in my hands, has done good service in my daily work in the studio for the last three years; and in the hands of others who have it in constant use it has never failed to give uniform and satisfactory results. The formula is as follows:—

Solution No. 1.

Nitrate of silver (in crystals)	1 ounce.
Common water	80 ounces.

Dissolve the silver in a winchester quart bottle containing the above quantity of water, and expose to the sun's rays or ordinary daylight for at least twelve hours; with some kinds of water it will be advisable to boil and filter before adding the silver. It is better to make several winchesters of this solution, and expose to light until required for use. The clear solution will be a sufficiently pure and neutral solution of silver, about five grains to the ounce; it should be allowed to settle perfectly before being decanted and filter for use, and great care should be taken not to disturb the sediment when pouring the solution into the filter. This precaution is absolutely necessary, as otherwise it will be difficult to filter the solution perfectly bright and clear. The best way of filtering is to well wet a tuft of cotton wool by holding it for a few minutes under a tap and press it gently into the neck of a large funnel of glass or porcelain. Filter papers should be avoided, as they are apt to contaminate the solution.

To make a new bath, dissolve two ounces of nitrate of silver in twenty-six ounces of the No. 1 solution; then add four drachms of the following:—

Solution No. 2.

Iodide of calcium	30 grains.
Distilled water	5 ounces.

Shake the bath after adding the No. 2 solution, and let it stand for a few hours; then filter, and the bath will be ready for use.

Plates excited in the bath made as above will be very sensitive, and the negatives perfectly free from pinholes; the solution will keep in order for a long time, and as soon as the films begin to show signs of the slightest deterioration from stains or insensitiveness the bath solution is to be treated in the following manner, when it will be found that it is at once restored to perfect working order, and will produce negatives equal in every respect, if not superior, to those made in the new bath:—To rectify the bath pour the solution into a large flat dish or tray, and allow it to evaporate to about two-thirds of the total quantity; now test the concentrated solution with the argentometer, and make up to the original strength of thirty-eight or forty grains to the ounce by adding a sufficient quantity of the No. 1 solution; filter, and the bath will be ready for use. The above treatment may be repeated as often as necessary; it has never yet been known to fail to restore the bath, however hard worked, to perfect working order. The fresh silver in the No. 1 solution will be found sufficient to replace the silver used in exciting the plates, thus keeping the bath of about the same bulk.

With regard to the best way of evaporating the bath: it is only necessary in the summer time to pour the solution into a large porcelain dish or *papier maché* tray, and leave it freely exposed for a few days in a warm place, or, in dry hot weather, for a few hours only. This plan of evaporating is by far the better one; but in the winter in this damp climate it is often necessary to use an evaporating dish, which can be placed in an oven or over a lamp stove without danger of breaking. There is no advantage in boiling the bath unless albumenised plates have been used, when the solution must be boiled to get rid of the albumen dissolved in it.

It is recommended, for the convenience of working, that two baths be kept in use, so that while one is laid aside to be treated as above the other will be ready for work.

In making a new bath, do not on any account adopt the usual plan of iodising with iodide of *potassium*, and avoid the use of a collodion containing a potassium salt. In the course of the experiments above alluded to it was abundantly demonstrated that the use of potassium in the bath or collodion is a fruitful source of pinholes.

The negatives should be soft and full of detail, clear in the deepest shadows, and of a reddish-brown colour. A cold, grey negative, wanting in gradation, and with the film partially eaten away in thousands of minute spots, is the result of a bath not sufficiently iodised. The remedy, whether for a new bath or one that has been rectified as above, is to add to each pint of bath a few drops of the No. 2 solution, and filter for use.

With regard to the exact way in which the addition of the iodide of calcium to the bath, and the consequent formation of nitrate of lime in the solution, affects the working qualities of the bath—and especially in preventing pinholes—I would like to leave that matter in the hands of some of our able chemists who may care to investigate the subject. I may, however, just suggest that, as it has been proved that sulphate of silver is a prolific source of pinholes, it is possible that the nitrate of calcium in the bath acts as a safeguard against the formation of sulphate of silver, by taking hold of any sulphuric acid with which it may come into contact, and forming the insoluble sulphate of lime, which would be precipitated. Be this as it may, it is a fact that I have restored an old bath giving a fine crop of pinholes by simply adding the solution of iodide of calcium in excess and filtering.

I find that the bath is best when fully saturated with iodide; in fact, I do not think it possible, under any circumstances, to over-saturate a bath with iodide of silver.

In conclusion: I shall be happy to answer any question or to give such further information as any member may require; and I trust that all who adopt the plan I have described will find, as I have done, that whatever other difficulties may arise in the practice of photography, there will be no further trouble with the nitrate of silver bath. B. J. Edwards.

MOUNTING PHOTOGRAPHS.

Most amateurs, when mounting their photographs—say of the favourite cabinet form—have, no doubt, been astonished to find that, although all the pictures had been cut with the same shape, leaving perhaps a margin of one-eighth of an inch at the top and sides, some of the prints nearly covered up the card in the length, while others had the opposite fault.

The subject of expansion of the paper in one direction has lately been brought forward, as tending to give two different ideas of the same portrait; but the slight difference can hardly be perceptible except to a very critical observer.

When it is a question of mounting a number of photographs to a shade within a line then the matter becomes serious, and it is an absolute necessity to have two different shapes—one for those prints cut across the paper, and the other for those cut lengthwise. The former will have to be (for cabinet size) nearly one-sixteenth of an inch shorter, and the latter one-sixteenth longer.

It is best to mark the paper cut across the sheet before printing, so as to know which shape to use; but, in case this has been neglected, the two classes of prints may be easily separated by slightly warming them, the cross prints forming themselves into a short roll, and the others into a long one. They can then each be cut with their own shape, and when mounted will be found to occupy the same position on the mount.

In using an alcoholic solution of glue, where very little water is present, the stretching of the paper is reduced to its minimum. This is best made as follows:—Soak common gelatine (glue will answer) in as little water as will just dissolve it. While hot pour in gradually methylated spirit, stirring all the time until the spirit is in about the proportion of three to one of the gelatinous solution. A species of precipitation takes place, which, however, redissolves on well stirring. A little glycerine or sugar can then be added.

Great care is necessary in mounting with this material, as if once the print is laid on the mount it is almost impossible to remove it.

Walter B. Woodbury.

RED OR GREEN?

However difficult it may be to get ideas into the heads of some people, it is confessedly much more difficult, when once they are there, to get them out again. I heard a good illustration of this some time ago, when in conversation with an extensive copperplate printer who was laboriously endeavouring to introduce a method of photo-mechanical printing into his business. He said:—"There is no difficulty with the process when I work it myself or stand over the printers while they are at work; but the moment my back is turned they fall into the way of working to which they have been trained, and so spoil all. What I want, and find most difficult to get, is *wooden-headed* men who will leave the thinking to me, and do just exactly as they are told."

In nothing, perhaps, is this difficulty of unlearning more frequently seen than in the pertinacity with which *yellow* is claimed as one of the primary colours, and green, "nature's glorious garb," degraded to a mere secondary. Men who are well up in scientific matters generally, and who know also a good deal about the beautiful laws of light, are found writing of the primaries as *red, yellow,* and *blue,* instead of *red, green,* and *violet,* and that, too, in spite of the fact that a little consideration and a few simple experiments would make it abundantly clear that the earlier writers were wrong, and Young, Herschel, and Clerk Maxwell right. Curiously enough, also, the principal fact on which the erroneous opinion is often based—the production of a green by the mixture of yellow and blue pigments—is, when properly considered, one of the clearest proofs of the fallacy of the notion. In connection with this subject, I once heard the late Sir George Harvey, President of the Royal Scottish Academy, declare before a meeting of the Royal Scottish Society of Arts that so long as he could produce a green on his palette by a mixture of yellow and blue, it was little better than presumption for any mere theorist to try to lecture him into the belief that green was a simple colour.

In discussing questions of this kind we occasionally hear it said that it is no great matter how they are expressed so long as the intention of the writer is thoroughly understood; but truth is truth, and surely to a photographer, whose very existence depends on light, and whose most brilliant discoveries yet to be made may depend on the correct appreciation of that truth, the question is of the utmost importance.

But, simple as the question is, I cannot expect that the Editors would allow me sufficient space for anything like an exhaustive *résumé* of the present position of our knowledge of it, the more especially as it will be found plainly laid down in the works of the writers already mentioned. I shall, therefore, confine myself to the suggestion of one or two experiments that, to my mind at least, makes the matter quite clear, and refer those interested in the subject to the works of the writers to which I have referred.

And, first, let us try to dispose of the mixed blue and yellow pigment evidence. No doubt the best way to experiment in this direction would be to pass sunlight through a prism or prisms, receiving the separated rays on an arrangement of narrow mirrors placed side by side, and capable of being each turned to various angles. In this way the various rays could be further separated, or made to combine on a suitably-placed screen; but those for whom I am especially anxious to write have not generally the necessary convenience for such arrangements, and sufficiently convincing results may be arrived at in simpler ways. Coloured glasses, if the pure tints could be obtained, would be most easily manipulated; but I have always found much difficulty in getting glass in anything like pure colours, and so I generally have recourse to gelatine films, which are easily got, cost little, and answer tolerably well, being readily made to adhere to a glass plate, stripe over stripe, in any desirable position. Probably the simplest plan is to use a pane of a window on which to place the coloured stripes, which may conveniently be about five inches long by one inch broad.

Suppose, then, that on such a pane we fix perpendicularly the stripes—respectively red, green, and violet—keeping them an inch apart, and over them, horizontally, a yellow and a blue. If the yellow were a primary colour it would necessarily be opaque to the red and to the violet, as it could only pass rays vibrating at the same rate as itself, and so only the yellow of the green, supposing the green to be a secondary colour, could be transmitted. But both red and green are found to pass through readily, thus proving the yellow to be a compound of those two colours. In the same way the blue, if a primary, should, if a stripe be laid over the yellow one be opaque to the green that had passed through it; but, in reality,, the green passes through the blue also, showing unmistakably that blue is a compound of green and some other ray. In other words, while the yellow film stops certain rays, and the blue is opaque to certain others, both agree in passing green, thus showing that green enters into the composition of both.

On the first introduction of Clerk Maxwell's "colour top" much disappointment was felt at the inability to produce the supposed secondary, or compound, green by combining the yellow and blue rays; but the foregoing experiment proves that when that colour is produced by the mixture of pigments it is not effected by a combination of the rays, but is due solely to the fact that the yellow passes the red and green while stopping the rest, and the blue stops the red but passes the green. A slight examination of various blue substances by means of a prism will also make it abundantly clear that that colour consists of green with the rays of greatest refrangibility, and forces the observer to the conclusion that the primary colours are red, green, and violet.

Those who have the convenience, or who may be inclined to go to some little expense in the investigation, may, by aid of the prism and set of mirrors already mentioned, illustrate in the most satisfactory manner the cardinal facts—that by no possible combination of coloured rays can either red, green, or violet be obtained, while by the union of the violet and green and the green and red, respectively, the most brilliant blue and yellow is produced.

John Nicol, Ph.D.

A FEW EXPERIENCES IN THE STUDIO.

[A communication to the Edinburgh Photographic Society.]

I desire to say a few words tonight by way of encouragement to amateur photographers, with, perhaps, a few hints to aid those who are just beginning to try their "'prentice hands" on that portion of our beautiful art which, as a matter of course, I consider the highest as well as the most interesting—I refer to portrait photography. Is it the difficulties that have to be overcome, or a wish to avoid the particular domain of professional photography, that so few amateurs attempt great things in the way of portrait or subject studies? I really think more might be done in that direction than I have either seen or heard about. Why not try composition, or even simple subject pictures, and not always views? What a field to display artistic thought and talent! and what an amount of pleasure might be given to others by a quaint conceit or a happy thought conveyed to our minds by such means! In many cases amateurs could afford more time for such studies than the professional photographer, while it would be a great help in directing attention to that branch of our art, and giving it the prominence it deserves.

I speak for myself when I say that I am sorry I cannot, from press of business, devote a little of my time to portrait subjects produced by the camera. By the way of a little help and encouragement to any amateurs who may think of trying to photograph the "human face divine," I do not think it would be a bad plan to run over the taking and finishing of a portrait negative; at the same time I confess it would come easier for me to give practical illustrations, and which would be understood better than I can hope to do by the pen.

I have always found that beginners in either painting or photography are apt to imagine that a great deal, if not all, depends on the amount and variety of the compounds used. However, as they gain experience they find out that the simple palette both of colours and of chemicals is the best, and that the production of good pictures in either branch of art depends not so much on the materials used as in the amount of talent and perseverance of the user. With these few remarks we shall go to work.

Preparation of the Plates.—Prepare your plates by first rubbing them with nitric acid and water, wash well under the tap, and, while still wet, flow over the plate twice with albumen (white of one egg to twenty ounces of water, filtered, and add a few drops of carbolic acid). This I have used for many years, and must say I have not found it to injure the bath in the least. By using it you can be certain of a clean plate, and the film will be held firmly on the glass.

Make up the nitrate bath of the usual thirty-five-grain solution. From experience I have found it to produce the best results, and to be more depended on if no fresh silver be added to the bath as it gets used but simply, when it shows signs of decay, to put it and a handful of salt into the silver washings of the prints and make up a fresh one. You thereby save reputation and temper, and get that bloom on the negative which I find impossible to get in an old bath. The keystone to all good pictures is the bath, and this plan may seem to cost more than adding silver; but I do not think you will find it so in the long run. Filter your bath as seldom as you possibly can.

Collodion.—A mixture of two good makes works the best when a few days old. Make up a little at a time, so that you may get plenty of detail, softness, and quickness of working.

Lighting.—A great fault in amateurs is using too much light. You will be surprised how little you can work with if it is well directed and under control. An eight-feet roof and side is quite sufficient, cutting off nearly all front light by a curtain, and then gently relieve the shadow side by a reflector. The one I use consists of two screens four feet square, on a stand so arranged that the light can be thrown up. However, any arrangement will do provided you use it properly. A newspaper on a head-rest makes a very good reflector, and is easily renewed. Great care is required in using the reflector not to put it so close to the sitter that the shadows are destroyed or the disagreeable effect of a cross light produced; but just sufficiently near to enable you to see into the shades of the finished picture, and light up dark and heavy shadows. Give a good exposure, and do not mind for one moment the impossible short exposure spoken about in most cases. Expose for your half-tones, and let the lights and shades take care of themselves. A great number of otherwise good negatives are spoilt through under-exposure. An over-exposed negative can be improved, but little can be done to an under-exposed one.

Developer.—The following is one useful for all class of work:—

Sulphate of iron	¼	ounce.
Iron of ammonia	¼	,,
Spirits of wine	1	,,
Glacial acetic acid	½	,,
Water	8	ounces.

Put as little on the plate as you can, and do not rock it about. Keep on till every bit of detail is well out.

If you can possibly do without it do not intensify. I find it better, when required to do so, after fixing, to use a very weak solution of pyro. and acid, and a few drops of silver—just enough to turn the negative to a greenish hue; but as a rule I do not intensify at all. I wish to impress the importance of keeping your negatives delicate, as you are apt to destroy the half-tones. Negatives thicken as they dry, especially if you use heat.

Varnish with a good hard varnish, and rub a little powered rosin on the face, to give it a good surface to take the pencil.

Retouch carefully with a pretty hard pencil, softening without entirely removing all hard lines. Put lights on softly and in their proper places. It will prove that you have done the retouching wisely and well if you can see the skin of the face on the finished photograph and not white paper. I am afraid I am here touching on a sore point with some of the members that do not advocate improving the negative; but for one that does not require modelling there are at least a hundred that do. Do not hesitate to remove any blemish or defects you cannot see by the eye in the person photographed. Most portrait painters I find object to retouched work, but at the same time they know well that what are called the pearly tints of the face are lost in the photograph. The delicate blue or green tints that so beautifully soften the edges of every shadow or wrinkle are not produced in the best negatives, and all require softening, less or more, to supply that defect in our chemicals. To model as it should be done requires a good deal of practice, and, above all, to know when to stop. Use the pencil on the face of the negative, softening the shadows with crimson lake on the back of the negative, put on with a hard brush in the form of a stipple.

The bath for paper which I find gives the best results is a fifty-grain solution, to be kept up to that strength, using a large bottle of solution, which only requires filtering once or twice in the year. All that is required is to decant carefully and not disturb the sediment. The toning bath I can recommend as a splendid keeping one is as follows:—Fifteen grains of gold, a tablespoonful of chalk, and sixty drops of a saturated solution of acetate of soda to a winchester of hot water. When cool it is ready for use. With the above you can procure any tone required, providing your negatives possess good printing qualities.

On the table you will find a few groups taken at Holyrood last week. They were simply developed slightly, washed, and not fixed till the evening. Others taken the same day were not finished till the following morning. I merely mention this to show that negatives are not spoiled by being kept for some time, but, on the contrary, I think they rather improve.

Peter Low.

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UPON THE INTENSIFICATION AND TONING OF CARBON PICTURES; BEING REMARKS ON VON STEFANOWSKI'S METHOD.*

Carbon pictures are coming into fashion; but the triumphal march they have undertaken on their own feet is somewhat slow, so that some folks put crutches under their arms, and thus, though unjustly, carbon pictures give one the impression of being weaklings, which they are not. The pictures are frequently too thick, they are often too thin, and often the tissue has not the desired tone.

In this case chemical remedies are often proposed, and Herr von Stefanowski's article is especially rich in this particular; but, amongst the many methods given there, there are some very unreliable intensifiers, whose use is not to be recommended, but rather to be avoided. This is especially the case with the intensifier with iron salts and sulphide of ammonium (No. 7 in the article referred to), where a greenish-black colouring is obtained, based upon sulphide of iron. This colour, however, changes very rapidly in the air to a reddish-brown,† and even a quickly-applied varnish only affords a partial protection.

Almost as fugitive are the tones of the carbon prints produced by solutions of cobalt and nickel with subsequent treatment with sulphide of ammonium (Nos. 28 and 31), which lose their colour by oxidation, more especially in a moist condition.‡ Then all the cobaltic, uranic, and nickelous intensifications are not sufficiently stable, and I may also remark that (No. 32) chloride of nickel and ferrocyanide of potassium do not colour the picture brown, but greenish. The colourings obtained with ferro or ferricyanide of potassium—such, for example, as (No. 11) iron and ferricyanide of potassium, which produce Berlin blue—all bleach more or less when exposed to the light, though this bleaching may not be very evident for some months. They are, therefore, suitable enough for the enlarging process but not for transparencies, from which one demands at least the durability of silver transparencies.

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* See The British Journal of Photography for May 4, 11, and 18.

† Fresenius, *Qualitative Analysis*, 12th edition, page 137.

‡ Fresenius, *Quantitative Analysis*, 5th edition, pages 144 and 145.

Therefore I would warn anyone against the organic toning mediums recommended by Herr Stefanowski, if it be a question of toning pictures which are to be given into the hands of the public, and not merely to be used for some passing purpose. Such organic colours are the alkaline solutions of alizarine, purpurine, and coralline, as well as the alcoholic solution of aniline red, prescribed in Nos. 33 to 45. In No. 42 Herr Stefanowski recommends the agreeable tint got by extract of indigo and bichromate of potassium for toning landscape transparencies.

If I already consider it necessary under normal conditions to avoid Laurent and Monckhoven's toning of the carbon print with sulphate of iron and gallic acid to bestow on it a violet tint—because the gallic-acid ink, of which the violet colour consists, yellows after many years,[*] as all old writings show—still less can I agree to use an indigo and chromium toning. This inferior mixture, called chrome ink, which Runge discovered,[†] is still more fugitive than the gallic dye, for it is known that documents written with "chrome ink" fade away much more quickly than those written with "gall-nut ink."

As perfectly light and air-resisting only the tonings with permanganate of potassium, oxide of iron, and part of those with silver, can be indicated. From the number of the "permanent" I, however, except the manganic intensification, No. 4, where the aid of indigo is called in, and I very especially except the silver intensification No. 20, which is based on successive treatments of the carbon picture with bichromate of potassium and nitrate of silver, producing a brick-red colouration, which, however, scarcely lasts a few days, as chromate of silver is reduced by light with extreme rapidity.

Whether it is progress to introduce silver into the unfading carbon process—while the boast of the carbon print is that it allows of the elimination of a factor so unreliable in respect of durability as silver,[‡] which thus re-enters surreptitiously—I shall give no opinion. The silver intensification of the carbon picture is, however, very enticing, giving, as it does, results which excel those of almost all other methods of intensification in beauty.

The most imperfect of all the tonings mentioned are those with lead salts, which, if not unstable, give such horrible pictures that they are sure never to be used. Besides, the introduction of carbonate of soda between the treatment of the carbon picture with nitrate of lead and sulphide of ammonium in No. 14 is purposeless, while in No. 16, where we are told to treat the carbon picture with a mixture of ferrocyanide of potassium and nitrate of lead, and then with a solution of iron, the nitrate of lead has nothing at all to do with the matter. On the other hand, in No. 17, instead of toning the picture with a mixture of ferrocyanide of potassium and nitrate of lead, and after that with sulphide of ammonium, the ferrocyanide of potassium may be omitted without changing the result. As a correction of a matter of fact I may add that a lead picture blackened with sulphide of ammonium cannot be cleared or lightened by hyposulphite of soda.

Then, with regard to the suggestion made by Herren von St. Szretta and von Stefanowski to remove blisters by letting the undeveloped pictures lie a long time in water which had been boiled, I have not found it very effectual, as I only succeeded in removing by it small blisters. I do not think that the undeniable possibility of the removal of small air-bubbles by the action of water explainable as by absorption, can be very great, for according to Bunsen—who, with his usual extreme exactitude, determined the absorbing power of water for air—the absorbing coefficient of water at 18° C. is given as = 0·01732. If one considers that boiled water can get from the atmosphere lying on its upper surface all the air required for its saturation, and that for the removal of a blister the size of a pea the quantity of water required would have to be reckoned by litres, it appears probable that the greater part of the action should rather be ascribed to the attraction of the gelatine to the glass. This view would also support my opinion that cold water would also remove blisters if the plate were left in it all night.

I shall now briefly summarise my foregoing remarks by saying that one should forego these embellishments of the carbon picture, since, if it be fatal to mix fugitive organic colouring matter, which really improves the colour, with the carbon used to produce the tissue, it is still more fatal if, through the subsequent toning process, the quantity of perishable colouring matter be increased. One should rather try, in reforming photography, to replace these fading pictures by others as permanent as possible.

—*Photographische Correspondenz.* J. M. EDER, M.D.

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[*] Muspratt, *Technical Chemistry*, 3rd edition, vol. ii., page 349.

[†] Muspratt, *Technical Chemistry*, 3rd edition, vol. ii., page 345.

[‡] It has not yet been decided, as you all know, whether the hyposulphite of soda reduces the silver print, or it is not the paste, ozone, or some other agent.

FOREIGN NOTES AND NEWS.

SPUN GLASS FILTER.—SODIC HYPOCHLORITE AS A PREVENTIVE OF BLISTERS.—THE SOCIÉTÉ D'ENCOURAGEMENT.

THE spun glass cotton recommended by Dr. Hornig as a filter is supplied in three different qualities, and consequently at three different prices, the best quality costing twice as much as the third quality. The finest sort is said to be adapted for filtering substances which are undergoing analysis and for use in photographic studios, the second sort for ordinary work in chemical laboratories, and the third for chemical operations in wholesale houses.

In the *Correspondenz* Herr Mayer recommends the washing of pictures fixed with hyposulphite of soda in an extremely dilute solution of hypochlorite salts as a specific against the blistering of albumenised paper, which treatment neither makes the prints yellow nor spotty. His *modus operandi* is as follows:—After fixing the positives with hyposulphite of soda he pours some slightly warm, or at anyrate not cold, spring water over them, then lifts them one by one into a vessel containing sufficient water to wash them well. To every litre of water in this vessel he adds a spoonful of a solution the preparation of which will be given below. The vessel is then moved about so as to wash all the pictures, after which they are lifted separately back into the first vessel, which now contains the same quantity of water and of the solution as the second vessel. The prints are moved about for some time in this, after which they are washed twice or thrice in plain water. This process does not occupy more than five or ten minutes for a batch of from 150 to 200 prints. The paper, not being so much softened, is not so liable to be torn as with the usual plan of much soaking and many washings, and the whites are brought beautifully clear. Lastly: the pictures are said to gain in permanency; at least, to prove this last point, Herr Mayer has exposed prints so treated both in a wet and a dry condition to the action of the sun, the air, and damp for many days, and they have stood the test successfully. The principal ingredient of the solution used by Herr Mayer is "eau de Labarraque" (hypochlorite of soda) the action of which is similar to that of eau de Javelle, and which he prepares thus:—To 300 grammes of water add twenty-five grammes of chloride of lime and shake well; then dissolve fifty grammes of Glauber's salt (neutral sulphate of soda) in one hundred grammes of water. Mix the solutions, filter through a piece of linen, and store in a cool, dark place.

The French "Société d'Encouragement" offers for competition during this and the five following years fifty-five prizes, varying in value from 500 f. to 12,000 f., and forming an aggregate sum of 106,000 f., or £4,240. Of these prizes six are offered for subjects connected with mechanics, twenty-four with chemistry, five with agriculture, eight with manufactures, and two with *les beaux arts.* Under the last division is included a prize for a method of producing, by photographic means, printing-plates in high relief with half-tones. For these prizes foreigners as well as natives of France may compete.

Meetings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE usual meeting of this Society was held on Tuesday evening last, the 12th inst.,—Mr. J. Glaisher, F.R.S., President, in the chair.

The PRESIDENT announced that the Council had decided that an exhibition should be held, to open on October 9th and close on November 15th; that a large number of medals be offered for the best productions in certain directions then exhibited; and that a jury to determine the medal awards had been elected, consisting of two members of the Council, two members of the Society who were not members of the Council, and two gentlemen not members of the Society, but who occupied prominent positions in the world of art. He read a list of twenty-three different styles and kinds of picture or apparatus for which a corresponding number of medals would be awarded, and added that three other medals had been placed at the disposal of the jurors to be given for anything else of a meritorious character in their estimation. It was, of course, to be understood that the jurors would have power to abstain from making an award for any special class of production which, according to their judgment, did not reach a sufficiently high standard.

Mr. J. R. Sawyer then read a paper which had been announced as being "On the Continued Action of Light in Pigment Printing," but which he would intimate more correctly as being *On the Action of Light, Temperature, and Atmosphere on Sensitive Tissue.* Mr. Sawyer exhibited a large collection of prints in illustration of certain statements in his paper, these proving in a most unmistakable manner the great advantage, as respects the time occupied in printing, of giving a brief exposure to the carbon tissue in the printing-frame, and allowing several hours to intervene before developing. This permits the action of the light that was set up while in contact with the negative in the printing-frame to be continued after the removal of the tissue, until such time had elapsed as would bring the latent image to equal those that had been proved to be fully exposed when the development had immediately succeeded the exposure. We hope to publish Mr. Sawyer's paper in our next.

Captain Abney, with so many specimens before them, did not understand how the Photographic Society of France could be so incredulous regarding the continuating action of light, and he wished the members were with them during the present meeting.

The President conveyed the thanks of the members to Mr. Sawyer for his paper.

The Secretary then read a paper by Mr. Herbert B. Berkeley *On the Theory and Practice of Emulsion Photography.* This was followed by the reading of a short paper on the same subject by Captain Abney. Both these papers will appear in our next

The Chairman, while thanking Mr. Berkeley and Captain Abney, said that, owing to the lateness of the hour, he would have to adjourn the discussion on the subject of these papers.

Mr. R. W. Thomas, after making some observations on the negative bath, exhibited several large groups and photolithographs of maps and drawings, the work, he said, of a new form of lens that had recently been introduced by Herren Voigtlander. It was, he stated, the result of calculations by Dr. Somer, of Brunswick, and consisted of two achromatic and symmetrical combinations between which the central diaphragm was placed. No description of the optical construction of the lens was given; but Mr. Thomas, who said he was to be the agent for their sale in this country, indicated certain peculiarities in its working, concluding with observations of interest in a commercial rather than in a scientific direction.

Mr. J. Stuart protested against Mr. Thomas being allowed to make use of the Society to advertise a production in which he had a pecuniary interest.

Mr. Thomas rejoined that so much importance was attached to this new lens by the Photographic Society of France that they had appointed a committee to inquire into its capabilities.

The Chairman said that, from the scientific point of view, they were indebted to Mr. Thomas for introducing to their Society a new optical production.

The meeting was then adjourned to the 9th October.

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SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The last meeting for the session was held at the House of the Society of Arts on Thursday, the 7th inst.,—the Rev. F. F. Statham, M.A., President, in the chair.

Mr. B. J. Edwards read a paper *On the Nitrate of Silver Bath.* [See page 281.]

Mr. Baker stated that he had used Mr. Edwards's bath for two years, but could not get more than fifty negatives out of it without pinholes being produced. He had tried it with nearly every collodion that could be obtained, the result being always the same; eventually he added nitrate of baryta to the bath, by which a complete and permanent cure had been effected.

In reply to a question by Mr. Edwards,

Mr. Baker observed that he had followed in every particular the instructions in the formulæ, for which he had paid two guineas.

Mr. Edwards said he was certain that something must be wrong, as he had never had a case of failure. In now making public his method of treating the silver bath he was not committing any breach of engagement with those to whom he had sold it, for he had not divulged it until after the expiration of the term during which he had pledged himself to keep it secret from the public.

Mr. F. York had had in former times a great deal of trouble with his bath, but with the adoption of the nitrate of baryta bath all his troubles had terminated. He then described how he had satisfied himself that sulphate of silver did not produce pinholes, as had been alleged, as he had saturated a bath with it, afterwards adding nitrate of baryta, and that bath worked quite free from pinholes. He might have been inclined to have given Mr. Edwards's bath a trial, but the baryta gave him such entire satisfaction that he saw no use in trying anything else.

Mr. L. Warnerke observed that every photographer had his own ideas regarding the cause of pinholes. His (Mr. Warnerke's) idea that they arose from the fulminate of silver was still retained by him; he had seen no reason to change his opinion.

Mr. W. Brooks had used almost every kind of iodide and bromide in collodion. In making a bath he used common water from the tap, dissolved the silver in it, and placed it in the light. He then saturated it to only one-half its solvent powers with iodide of silver, and never got a pinhole. However, it was his opinion that he would not in future use nitrate baths much, if at all, as he found emulsions to answer his purpose so well.

Mr. E. W. Foxlee considered that pinholes were produced from more than one cause. He could not divest himself of the idea of the presence of bromides in the collodion having largely to do with the formation of pinholes, for previous to the introduction of bromised collodion he, at at anyrate, had never seen pinholes.

A Member said that, in his experience, pinholes were often obtained with purely iodised collodion previous to the introduction of bromides in collodion.

Mr. Foxlee said that the plan recommended by Mr. Edwards was what he had used for many years, and by means of it he had kept one bath, which contained one and a-half gallon of solution, in order for five years. On Saturday afternoon he poured it out in a flat dish, in which it was exposed to light all the following day (Sunday), and on Monday it was filtered. This treatment ensured the good working of the bath for two weeks at least. He desired to direct their attention to the subject of oyster-shell markings upon the surface of the plate. Of two methods suggested for getting rid of these markings—namely, removing the plate quickly from the bath, and thoroughly draining the plate before exposure—the latter was to be the more commended. It was a mistake, however, to imagine that the plate would be sufficiently well drained in two or three minutes. At the Autotype Works they drained their plates for ten or fifteen minutes, and these markings never appeared. But in order to drain the plates under the most favourable conditions it was necessary that they be retained in a moist atmosphere. This was secured in the most effective manner by having the bath so constructed as to enable the plate to be reared on end while protected from light by a closely-fitting cover. [Mr. Foxlee exhibited a porcelain well-bath which he used for this purpose.]

Mr. Bridge, although not troubled with fog or pinholes during many years, had, nevertheless, occasionally experienced great annoyance by the formation of these markings, which he now understood arose from want of draining.

Mr. F. Howard considered that a prolonged draining of the plate was almost impossible when one was out in the country using wet collodion plates for taking landscapes and other scenes. In his hands the addition of a drop of water to the collodion prevented the formation of oyster-shell or other surface markings.

After a conversation on the subject of the filtration of collodion and emulsions, during which glass-wool, tow, and felt had been eulogised by the several speakers,

Mr. T. J. Pearsall said there could be no question of the value of such meetings, where differences in practice were discussed, and on some subjects of debate sometimes matters of value might be inferred from what was unsaid. Thus in the filtration of collodion Mr. Edwards had laid stress on the value of filtering through cotton in preference to paper; indeed, he emphatically repeated his advice not to use paper. From this it seemed clear that, from his practice, he decidedly preferred the one to the other, and yet the differences might fairly be expected to arise from small or overlooked causes, such as the presence of earthy salts or mixed fibres in the paper. As to the use of fine glass as a filtering body, it was well known that glass would yield up its constituents readily to water; when finely divided the alkali was made strongly evident. *Apropos* of Mr. Brooks's remarks as to the possibility of a double salt of sulphate of silver being the cause of pinhole defects, he (Mr. Pearsall) thought double salts in photography might be found to be causes of interference; thus the sulphate of potash was well known as a salt of difficult solubility, and its crystals were solids having no water of crystallisation. But there were frequently salts of sulphuric acid, metallic oxides, or earths and potassa—double salts, in fact, with potash—much more soluble, and uniting with water of crystallisation. It would be useful for the photographer to bear in mind that if a substance were nearly insoluble, like sulphate of potassa, that its character might completely change by union with another base; thus we have sulphate of ammonia and iron, sulphate of potash and iron, and there were well-known double salts of silver.

After some further conversation the Chairman conveyed to Mr. Edwards the thanks of the meeting for his paper.

It was arranged that an outdoor meeting should be held, on the first Saturday in August, at Hampton Court, of which due particulars would be furnished to the members.

The proceedings then terminated.

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EDINBURGH PHOTOGRAPHIC SOCIETY.

An ordinary meeting of this Society was held on Wednesday, the 6th inst., at 5, St. Andrew-square,—Mr. J. Lessells, President, in the chair. The minutes of the previous meeting having been read and approved, Messrs. J. McLaren, J. Ballantyne, Jun., S. Wellstood, W. Porteous, and J. Morton were admitted ordinary members.

The Secretary read a paper by Mr. Peter Low on *A Few Experiences in the Studio* [see page 283], and handed round several very fine prints as examples produced in the ordinary course of business.

Mr. **Norman Macbeth** quite agreed with Mr. Low in his statement regarding the quantity of light that should be admitted into the studio, and thought that, as a general rule, photographers used too much, or too much diffused. To this cause was due the fact that in many cases it was difficult, in examining a portrait, to discover the source of light. With diffused light the photographer could never produce pictorial effect; and, as a rule, the less that was employed, if properly concentrated and directed, the better would the results be. One difference between an ordinary photograph and a work of art lay in the absence in the former of the poetry of art and sentiment, neither of which could be attained unless by a properly-concentrated and directed light. Mr. Low, he thought, was equally right in avoiding intensification of the negative as far as possible. Photographs, in common with paintings, contained, or ought to contain, first high lights, then half lights (which was the region of colour), then middle tints (which was the beginning of shadow), and shadow. The "pearly tint" was the region of colour, and wherever much intensification had been resorted to that was lost, and with it much of the charm that the picture should possess.

Dr. **Thomson** thought the remarks about the use of only a small quantity of developing solution of much practical importance. No doubt considerable dexterity was required in the use of only a little developer to get the surface of the plate evenly and rapidly coated, and so prevent unequal development; but the results were well worth the practice necessary to enable the operator to do it properly. The resulting negatives were much finer, and there never was any necessity for after-intensification.

Mr. W. T. **Bashford** said that Mr. Low's experiences were very similar to his own. He thought the key to the highest class of work would be found in casting aside all ideas regarding the doctoring of the bath. He did not believe that really high-class work could be made with a doctored bath, and under that appellation he included filtering. Years of experience had convinced him that whenever the bath gave evidence of being out of order it should be thrown down, and recourse had to a new one.

Mr. E. R. **Yerbury** could corroborate Mr. Low's observations regarding the advantage of keeping the plates for a considerable time between sensitising and exposure. He (Mr. Yerbury) generally had a few ready, and found that when kept in a box they worked very well after a period of at least two hours, and developed quite free from stains or markings of any kind.

Mr. **Dobbie** (in moving a vote of thanks to Mr. Low) said that the author of the paper had been too modest in his title. Instead of "a *few* experiences," the paper really consisted of the valuable experience of a most careful and successful operator of many years' standing.

A number of the pictures taken at the late outdoor meeting at Bothwell Castle were submitted for inspection by Messrs. Mathison, Crighton, Turnbull, &c., and elicited a good deal of discussion, and some of them much admiration. In reply to the President,

Mr. A. **Mathison** said that, with one exception, all the plates exposed at Bothwell were by the collodio-bromide emulsion, and of nearly similar quality; that is, containing just a mere trace of free bromide and with a preservative of simple bitter beer. To this latter circumstance might be due the fact that long exposures were required, or at least that long exposures seemed to give the best results. In his own case he had given from thirty to forty minutes, and the members had an opportunity, by the examination of some of the prints on the table, of seeing whether he had given too much. The development was conducted by first moistening the plate with water, then flooding with a saturated solution of carbonate of ammonia to which had been added a few drops of an alcoholic solution of pyrogallic acid. By keeping the pyrogallic acid well down the image came up at first thin and delicate, and readily acquired density on the addition, from time to time, of a few more drops of the alcoholic solution. As a rule, the restraining action of a bromide was not required; but, should the development appear to be proceeding too rapidly, he added a little, which kept it within bounds. As a guide to beginners in the development of those plates he might say that, on an average, the process in his hands occupied about ten minutes.

Mr. **Bashford**, until quite recently, had given little attention to dry-plate work, but he had got initiated into the mystery by Mr. Mathison, and could bear out his statements regarding the facility of working the kind of emulsion in question. He had been trying it for enlarging, and found it to possess advantages over the process he had been in the habit of using. It was simpler, not so liable to stains or markings, and developed quite as well as did a wet plate, while any required density could be readily obtained. His first experiments were made with emulsion kindly supplied by Mr. Mathison, and, not liking to ask for what he was not allowed to pay for, he had obtained a supply of a commercial article, but found it required a much shorter exposure than that which he had been giving; in fact, it was too quick for his purpose, but a wash with bitter beer was found to make it slow enough.

Dr. **Thomson** said that in dry-plate work generally, and especially in emulsion work, each operator succeeded best with his own preparation, or with that with which he was best acquainted, as he knew how to prevent a fault or where to find a remedy. It was to him a matter of surprise that professional photographers had not long ago adopted an emulsion process for their portrait work. There were many advantages that would arise from being able to prepare a supply of sensitised plates for the day, and he believed, from his own experiences in another direction, that if a plate were coated with emulsion and placed in water it would keep for any reasonable time, and be quite as sensitive as ordinary wet collodion. Those who tried to coat a plate with emulsion for the first time might find some difficulty in getting a smooth, uniform film. With ordinary collodion, the plate, in pouring off, might be raised to the perpendicular without injury; but in the case of an emulsion it should be tilted off the level only enough to cause the superfluous quantity to flow in the bottle.

Mr. T. **Pringle** said that until the Cadzow Forest trip he had little or no acquaintance with dry-plate work, but he must confess to a liking for greater rapidity than could be got with the emulsion under discussion. He procured some uranium plates, and, according to instructions, exposed from thirty seconds to a minute. He did not very well know how to set about the development, but Dr. Nicol happened to call, and from information got from him he succeeded perfectly at the first trial, and managed to get a number of really excellent negatives.

Dr. Nicol then read a report from the late exhibition committee to the Council, after which the meeting was adjourned.

Correspondence.

PERMANENCY OF CARBON PRINTS.

To the Editors.

Gentlemen,—A ramble on the Yorkshire wolds, where postal communication is not an everyday occurrence, must be my excuse for not sooner taking note of the "Peripatetic Photographer's" remarks on my letter. Being human I may be wrong, and I have probably not quite correctly stated "the nature of the change that takes place in a carbon print."

I am not aware that I tried to state the *nature* of the change, nor do I think I have brains sufficient to do so, neither am I at present much concerned about the exact "nature of the change," &c. What I am most concerned about is a reply to the question—Do carbon prints, from any cause whatever, fade?

As the "Peripatetic Photographer" has for years been writing to your Journal on almost every conceivable thing connected with photography, I am compelled to accept him as an authority, and for a moment let us see where his correct description of the nature of the change in a carbon print leads us to.

His statements are (and I shall be sorry if I at all misquote him) the high lights of a carbon print are simple, pure paper. He then gives an example to show how, under the influence of light and atmosphere, this paper will become a "dingy, brownish-yellow." From these statements it is only fair to say—1st. A change does take place in carbon prints. 2nd. Owing to the medium on which carbon prints have to be mounted they lose their first bloom, and if "dingy brown" is the colour to which they change they cease to be "a thing of beauty." This being the case, the "Peripatetic Photographer" has simply conducted us into the same street as silver prints.

This reference to the paper on which carbon prints are mounted recals to my mind that a study of your Journal for some years past will show the fact that the fading of silver prints have, in many cases, been attributed to impure mounts. Yet, according to the "Peripatetic Photographer," simple *pure* paper is the enemy that lurks beneath the carbon print. This fact—if it be one—coupled with the insidious poisoning known to be connected with carbon printing, makes me think that we had better make the best use of the "ills we have than fly to others we know not of."

In my last communication I metioned some prints thirteen years old; since then I have seen some printed just after the Manchester Art Treasures' Exhibition in 1857. They are as clean and bright as need be. If by any known system or amount of care the like of these can *now* be done what more is wanted? It is certainly much more pleasing to see these old specimens than to be like a photographer at one of our fashionable watering-places, and whom I know well. He went to the trouble and expense of fitting up carbon specimens in beautiful frames, showed them to his customers, and earnestly spoke of their guaranteed permanency, when, lo! after a few weeks' exposure he was seen one morning standing aghast with his hairs on end, having discovered that his carbon prints had been fading by degrees and gone beautifully faint.

Another photographer, in Manchester, whose show-cases called attention to the permanence of the prints, soon showed signs of spottiness. Perhaps the "Peripatetic Photographer" will be able to tell us how these changes take place.

I am not so conservative as to be opposed to change, only I do not want to follow the fashions, and rush into change for the mere sake of it. Show us something really better, and *prove* it as permanent as talk would make it, then carbon may supersede silver, and none will be more pleased than myself when I can place work in the hands of my customers with the absolute certainty that it is not the fleeting representative of the original.—I am, yours, &c., Vox.

June 11, 1877.

EMULSION PHOTOGRAPHY AT THE SEA SIDE.

To the EDITORS.

GENTLEMEN,—If I remember rightly, I think I have seen it stated in the Journal or elsewhere that sea air is detrimental to emulsion plates. This, in a measure, corresponds with my experience with the above-named process for the two or three years I have been practising photography; that is, I can produce negatives freer from pinholes and similar defects when working in the country than at the sea side.

As I am desirous of spending my summer holidays on an island in mid-ocean, and intend taking my apparatus with me, I thought I would ask your opinion on this matter, as I should not like to have my "trouble for my pains." Also, if you think the emulsion process unsuitable, could you recommend any other one that would stand the strong sea air of so exposed a situation?—I am, yours, &c., C. P.

Lapwing Lane, Didsbury, Manchester,
June 12, 1877.

[The emulsion process may be practised at the sea side without any fear of failure from that cause.—EDS.]

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"IMPURE OXYGEN."

To the EDITORS.

GENTLEMEN,—I reply to the letters of the Messrs. J. and W. I. Chadwick (who are father and son) in last week's Journal.

After my letter in your issue of June 1st your readers will not be surprised at Mr. W. I. Chadwick not seeing the resemblance between my patent generator and his disguised copy, nor at his claiming the safety-valve on the retort, although in the oldest lists I have I see retorts with safety-valves which, I think, are at least quite as good, offered for sale. I have had a very neat and efficient safety-valve on my patent generator, but discarded it as useless; and I have a vertical generator, which has a safety-valve arrangement with more novelty about it, and can be sold at about half the price.

The proportions of one part of chlorate of potash and one part of manganese are the proportions given by Mr. W. I. Chadwick to a few of his friends just as the meeting was adjourning. He made no mention of gum water at the meeting, but left us to think the cakes were made from the ordinary oxygen mixture. One drop of gum water to a cake one inch thick and three inches in diameter containing between six and eight ounces of oxygen mixture Mr. W. I. Chadwick says is enough. Let anyone try it, and notice what effect it has. His statement in reference to the exhausted cakes is inaccurate, the whole truth being as stated in my last.

Mr. W. I. Chadwick, in his previous letter, says the gas "began" to come off in one minute and three-quarters, and instead of offering your readers an apology he goes further this time by trying to lead them to believe the whole of the gas came off in that time, the truth being it took him twenty-four minutes to cook two cakes, as I stated in my last letter.

I have asked your readers to divest Messrs. Chadwick's infringement of my patent of its disguise, and compare the generator proper with my patent generator; they are both in the Journal of May 18th. He has a perfect right to ask them to compare my patent generator with Mr. M. Noton's original retort. The only particulars I have ever seen of Mr. Noton's original retorts, &c., are those given at page 506 of the Journal for 1876.

Notwithstanding little differences I have always considered Mr. M. Noton as one of the great lights—if not *the* great light—of our Society; and if Mr. Chadwick had been as correct in his statements I should not have had occasion to ask your readers to think when they read, and to prove the correctness of his statements.

Just a word about all the good things connected with the oxygen generator, &c., done by Mr. Chadwick, Sen., "long, long ago." Was it not very unkind of him, "an old amateur photographer," not to let us know about it at the Manchester Photographic Society, even if he were not disposed to send full public particulars to your Journal?

If I wanted testimonials I think Mr. W. I. Chadwick's admission that more can be done on my plan in one hour than on his in two or three days would be a good one, and I do not think it speaks well for the cakes.

As I have done what I consider right in cautioning your readers against being misled, or led into unpleasantness, I will conclude by saying I shall be content to let the proper authority decide the legality of my patent.—I am, yours, &c., DAVID YOUNG.

Swinton, June 11, 1877.

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THE STAGE FOR THE LANTERN.

To the EDITORS.

GENTLEMEN,—One of my friends having hinted to me that if I turned to page 143 of THE BRITISH JOURNAL OF PHOTOGRAPHY, No. 187, for the 1st of April, 1863, I should see something to interest me, I have done so, and there I find a proper woodcut of a portable gas-holder fitted with a stage, and a lantern upon it, by Mr. Samuel Highley.

As I generally make a memorandum, on the outside of the Journals I receive, to assist me in finding any particular subject, it is certain I saw that article fourteen years ago; but I affirm most solemnly that all recollection had gone, and that I was absolutely ignorant of it.

There are ten memoranda in pencil on the outside leaf of that Journal, one of them being "Lantern (Highley's) 143." Precedence, therefore, belongs to Mr. Highley, not only in the stage but in the packing-up idea.

I shall now have no hesitation in again putting my lantern on the stage, as usual, without any fear, and in defiance of any patent monopoly, when next I want to use it.—I am, yours, &c.,

Salford, June 12, 1877. M. NOTON.

◆

OXYGEN APPARATUS.

To the EDITORS.

GENTLEMEN.—Since my communication of last week I have found in the Journal of April 1, 1863 (and other scientific works of a later date), a communication from Mr. Samuel Highley, in which he fully describes and illustrates by two woodcuts a portable oxygen gas-holder forming a stand for the lanterns, and in which the lanterns and other apparatus are packed when not in use. Mr. Highley states he exhibited the apparatus as described at the International Exhibition of 1862.

The difference between Mr. Highley's apparatus and that of Mr. David Young appears very slight. In Mr. Young's the lanterns are packed within the bell, which is inverted previous to packing, and would seem to be a *wet* compartment immediately after use; whereas in Mr. Highley's there is a separate water space surrounded by the outer casing, which decreases considerably the quantity of water necessary in Mr. Young's apparatus, and, moreover, the lanterns, &c., are packed in a *dry* compartment.

I think that the knowledge of the fact of Mr. Highley having used his gas-holder as a support for his lanterns, &c., and also that the whole apparatus can be contained therein as one package (both points claimed in Mr. Young's specification), together with the information contained in your last week's issue, will be sufficient to enable your readers to judge as to the merits and validity of Mr. Young's invention and patent.—I am, yours, &c., WILLIAM I. CHADWICK.

Manchester, June 12, 1877.

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PROFESSOR ABEL'S ANALYSES OF GUN-COTTON.—Much capital abroad has been made of the alleged incorrectness of Professor Abel's analyses of gun-cotton, "trinitro-cellulose" being constantly stated to be the name he gives to that body. So far from this being the case, he has written that the analyses of Messrs. Champion and Pellet, which assigns that composition to the product in question are to be interpreted differently, and that their concidence with that formula is merely accidental and due to a correspondence of the composition of the mixed product with trinitro-cellulose. The commercial cotton he states to be composed of a mixture with this compound of variable proportions of the following substances:—(*a*). Products of the action of the acids on the resinous and fatty bodies contained in the fibres of the cotton. (*b*). Cellulose which has escaped the action of the acids. (*c*). Mineral substances. (*d*). Nitrous products other than trinitro-cellulose, and soluble in a mixture of alcohol and ether.

ELECTRO-MOTIVE ORDER OF THE METALS IN CYANIDE OF POTASSIUM.—We have before been able to present to our readers several interesting facts with regard to gold and silver, published by the analyst to the Geological Survey of New Zealand, Mr. Spey, and we have again occasion to make extracts from his communications. In a paper recently read by him he gave many interesting data with regard to the behaviour of these metals to cyanide of potassium, the only part available for photographic usefulness being a list of the electro-motive order of many metals in cyanide as compared with silver and gold. He finds these latter two are very nearly alike in their affinities, and that in an alloy of the two the cyanide will dissolve both, but the silver to the greater extent. The following is a list of the electro-motive order of metals in cyanide of potassium:—

Carbon,
Platinum,
Iron,
Arsenic,
Antimony,
Mercury,
Lead,
Gold,
Silver,
Tin,
Copper,
Zinc.

This list runs downwards from negative to positive. Any one of these metals will generally precipitate the ones named below it from its cyanide solution.

PHOTOGRAPHY IN COURT.—On Tuesday last, the 12th inst., the case of Haydon *versus* Duncan (both photographers) was heard at the Clerkenwell County Court. The action was for alleged breach of contract, in which plaintiff claimed £25 damages for inconvenience and expense to which he had been put. Plaintiff had advertised his business for sale, and defendant agreed to pay £150 for the goodwill, the stock to be taken at a valuation. The defendant having subsequently declined to fulfil the contract the present action was brought. An objection was here taken by the solicitor for the defendant that the agreement, not having been stamped, could not be adduced in evidence without the penalty under the Stamps Act being paid. The Judge said that he feared the objection was a fatal one unless the plaintiff felt inclined to pay the penalty of £10. The plaintiff said he was not in a position, at the present moment, to do so. After consideration the Judge said he should nonsuit the plaintiff, but if he felt inclined to pay the statutory penalty at a future time he could then sue the defendant under the old Act; but, as the claim was only for £25, it was for the plaintiff to consider the matter. A nonsuit was accordingly entered, without costs.

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EXCHANGE COLUMN.

Wanted, a half-plate square camera in exchange for Elbert Anderson's *Skylight and Dark Room*, or one dozen 5 × 4 pine printing-frames.—Address, Photographer, Cleckheaton, Yorkshire.

I will exchange a new *carte* rolling press (by Solomon) for a repeating camera, two *cartes* on half-plate. Must be warranted in good condition. Or offers.—Address, A. H. P., 19, Worcester-street, Gloucester.

Two of Dallmeyer's rapid landscape lenses, 4½ inches focus (new), offered in exchange for Dallmeyer's compound stereographic lens, 3¾ inches focus, in good condition.—Address, G. Smith, the Castle Hill, Dudley.

Wanted to exchange, a Steinheil's No. 4 aplanatic lens for a Ross's No. 7 symmetrical; also a pair of stereo. landscape lenses, 5 inches focus, for a 12 × 10 water-tight bath.—Address, Geo. Hadley, 27, Alexandra-terrace, Lincoln.

Wanted to exchange, a pair of 6 or 7-inch Grubb's aplanatic single landscape lenses for a strong studio tripod, or a *carte* camera in good condition with repeating back; also, a pair of Ross's shortest-focus wide-angle doublets, for a Kinnear or bellows camera to open thirty-six inches, for plates 12 × 15.—Address, H. W., 43, Princess-road, Birmingham.

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ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

W. D. R.—The ferricyanide, or red prussiate, as given in the formula is the salt to be employed. The mention of the ferrocyanide in the third line of the same page is a typographical error.

W. W. T.—If the principle of dabbing the print with a sponge be adopted, the hyposulphite of soda may be removed in far less time and with a less expenditure of water than when the ordinary method of washing is employed.

New Moist Colour Box.—We have received from Messrs. Lechertier, Barbe and Co. one of their newly-introduced shilling boxes of moist colours. It will be a boon to those to whom economy is an object, the quality of the pigments apparently being excellent.

Anemone.—To increase the strength of the alcohol mix with it a little dry powdered carbonate of potash, and decant the supernatant fluid. It is probable that if you add about three grains more ef pyroxyline to the collodion it will flow with an oily smoothness.

Y. Z.—Something is decidedly wrong either with your preparations or in your manipulations. Seeing that the bath yields pinholes to the extent apparent on the specimens enclosed, would it not be well to adopt some of the remedies so frequently suggested of late? Read carefully the report of the meeting of the South London Photographic Society in our present number.

Amateur (Burton).—We presume you have obtained a good negative and that you wish to produce from it a transparency by the wet collodion process. Place the negative in such a position as to be backed by anything of an uniformly luminous nature, such as the sky or a sheet of paper (which must be inclined backwards). Make use of a very small diaphragm and do not give too long an exposure. For your special purpose it is desirable to use a red sample of collodion.

J. Houghton.—Our correspondent says he cannot give "M. N. O." the information he requires with respect to the use of dextrine as a mounting agent. He has used hot, thin glue, and also starch, but he considers both to be objectionable; the glue drys too quickly and fastens the heap of unmounted prints together at the edges, while the starch allows the prints to become loose at the edges. He adopts with complete success the method of mounting communicated to The British Journal Photographic Almanac for 1874, by Mr. J. G. Tunny, in which process a mixture of Bermuda arrowroot and Russian glue is employed. To this article we refer our readers. It is to be found on page 105 of the Almanac for 1874.

Mr. C. Whiting (of Semes House, near Ipswich) makes an appeal on behalf of an artist in distress. He says:—"Might I solicit you to assist a poor photographic artist residing at Kersey, a small village near Hadleigh, Suffolk, who has been ill with abcess in his face for six months past, and is still unable to follow his business. He has a wife and three children, one of whom has been very ill. With the exception of four shillings per week which the boy earns, they are entirely dependent on him for support. This poor man, I am sorry to add, is unfortunately in no benefit society, and consequently the family have been living very poorly upon the few charitable inhabitants of his village, who are very limited. He is ordered by the doctor to take plenty of wine and cod liver oil, but, being without funds, he is unable to procure these necessary remedies, and consequently does not get better. He belongs to a very respectable family but needy, and who, therefore, are unable to assist him. I pray, therefore, that the profession may kindly render a little aid."—We hope that this appeal will meet with a liberal response. The sum of £1 5s. is hereby acknowledged—the larger sum from Mr. Debenham, of Ryde, and the other from Mr. Reed, his operator.

H. W. D. (Ryde).—As we have recently varnished several negatives of a kind similar to yours, we are in a position to compare notes. The particular description of varnish which we used was composed of one part of "white hard spirit varnish" diluted with three parts of strong methylated spirits of wine. With this preparation, and by previously warming the plates to such a degree of temperature as not to allow them to feel inconveniently hot when laid upon the back of the hand, we have obtained a bright, beautiful, and uniform surface. Try the following method of developing gelatine plates:—After wetting the surface with water, apply a four-grain solution of pyrogallic acid to which about an eighth part of ordinary table ale has been added. Pour this over the surface and then return it to the developing dish, into which pour two or three drops of greatly-diluted ammonia. This will bring out the details slowly, but in a very clean and intense manner. Of course any indication of fogging must be checked with the bromide solution.

Aberfeldy writes as follows:—"I hope by your experience and kindness to be informed through the medium of the Journal how I can remove nitrate of silver stains out of red, brown, and white stones or tiles that form the floor of a cathedral which I had been photographing, and upon which a careless operator allowed drops of the silver from the dark slide to fall. This happened about three weeks ago. The officials of the place are making a great noise about it; and no wonder, as the floor is laid with diamond-shaped stones or tiles about six or seven inches in size, each of various colours. The silver spots on these look horrible; and I believe that unless I can get them removed successfully they will be raising an action at law against me. I cannot move a step in the matter until I hear from you."——In reply: we beg to state there is no doubt that if such an action be raised our correspondent will have to pay all costs, and very properly so. But it is singular that he does not appear to have made any effort to get the stains removed. In all probability this can be effected in a few moments by making use of a *strong* solution of cyanide of potassium nearly saturated with iodine. A single application of such a solution will doubtless entirely remove the stains. But the cyanide to be employed for this purpose must be of the strong kind used in electro-metallurgy, and sold at about four shillings per pound; for the rubbish that some manufactures supply for photographic purposes, and which is sold retail at about two shillings per pound, is quite unsuited for such a purpose as that which we have now indicated.

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Tissandier's Photography.—We understand that a second and revised edition of Tissandier's *Photography* will shortly be published by Messrs. Low and Co. The part which Englishmen have taken in the discoveries and progress in photography will receive more attention, and the work will be enriched by specimen prints of the Woodbury, lichtdruck, permanent ink, Alberttype, and other processes.

Popularising Chromotype.—Messrs. Wolstenholme Brothers, of Blackpool, have sent us specimens of *cartes* printed in chromotype, which they are sending to every lodging-house keeper in Blackpool. The specimens are charmingly printed and are very attractive, being portraits of children. For this reason they are certain to be treasured by the recipients, who will necessarily bestow a corresponding degree of attention upon the circular by which the portrait is accompanied.

West Riding of Yorkshire Photographic Society.—On Wednesday, the 6th instant, the members and friends of this society availed themselves of the first monthly excursion of the season to visit the Ryburne Valley. Proceeding by waggonette from the Sowerby Bridge Station the party were conveyed up the valley. Many of the excursionists alighted at Slitheroe Bridge and proceeded by the stream up the valley. The scenery in this locality is something grand. Those of the party who proceeded forward in the waggonette to the Derby Inn were joined there by their friends, when ample justice was done to the excellent tea provided, especially so by those who had walked up by the stream. The rain came down during the time the party were at tea, and continued till the station was reached. The members intend going to Milner Field, the seat of Titus Salt, Esq., Saltaire, on July 4th.

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METEOROLOGICAL REPORT.

Observations taken at 406, Strand, by J. H. Steward, Optician.

For the Week ending June 13, 1877.

These Observations are Taken at 8.30 a.m.

June.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks
7	30·18	W	51	58	69	46	Bright
8	30·17	S	52	61	73	50	Cloudy
9	30·12	W	58	65	80	58	Bright
11	30·12	N	60	65	84	56	Hazy
12	29·88	SE	64	68	75	58	Cloudy
13	30·01	E	57	60	64	58	Dull

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 894. Vol. XXIV.—JUNE 22, 1877.

EXPERIMENTS WITH PRECIPITATED EMULSIONS.

As might fairly be expected, the various samples of pellicle described in connection with our course of experiments last week gave, when redissolved, emulsions of very distinct physical characteristics; indeed, viewing the results from a purely physical standpoint, almost every variety of film was obtainable, from the comparatively tough kind usual in ordinary dry processes to the most powdery and rotten descriptions which scarcely come under the head of films. But in addition to the physical differences there was also displayed a great variety in the photographic or chemical properties of the emulsions, the two effects of precipitation appearing to operate quite independently and, in some cases, in opposition to one another. In ordinary emulsion work—that is to say, with unwashed emulsions—it is generally understood that a "powdery" or high-temperature pyroxyline is conducive both to sensitiveness and to density of the image; but with washed emulsions we have always found that, while a powdery pyroxyline tends to increase the sensitiveness of the emulsion, a fuller-bodied cotton is necessary in order to enable us to secure density easily. This points to an alteration in the nature of the pyroxyline by the action of washing, and a study of the different effects obtained with the emulsions under notice leads us to the belief that this modification of the pyroxyline is very much greater in the case of precipitation, if not, indeed, totally different. It is certain that, by the introduction of different substances into the emulsion as well as into the water used in the precipitation, the result may be modified and regulated to a surprising degree; and it is, doubtless, owing to this fact that so much uncertainty has arisen in different quarters as to the value of the method of precipitation.

Of the eight samples of precipitated emulsion described last week only seven have been redissolved, the amount of precipitate obtained from No. 1 being so small and its collection so difficult that we rejected it as unavailable for comparison. The others may be briefly described.

No. 2 on the list—prepared by precipitating, *à la* Chardon—an emulsion containing excess of bromide, gave a thin, fluid result, which, though exhibiting no visible signs of granularity, showed by its colour that the suspended bromide was far from being in a state of the finest division. Images developed upon these films appeared slowly and without fog, but were extremely thin and almost impossible to intensify. If a tolerably strong picture were produced by repeated doses of alkali it almost entirely disappeared under the action of the fixing solution. The dried film was hard and devoid of lustre, and clung tenaciously to the glass.

No. 3 gave an emulsion of a brownish-yellow tinge by transmitted light, carrying in suspension innumerable minute particles of bromide, sufficiently large, however, to give a dusty, granular appearance to the film upon glass. But these coarser particles settled to the bottom of the bottle after about an hour's rest, when the emulsion gave a thin, transparent film of good colour. The image, upon development, came up more rapidly than in the previous case, and, in the better-lighted portions, intensified with tolerable ease; but the feeble details seemed to resist entirely the prolonged action of either alkaline pyro. or silver, and disappeared almost entirely in the fixing solution.

No. 4—prepared by pouring the emulsion into the organifier—gave a result of an improved character, the emulsion exhibiting little, if any, tendency to deposit any coarse particles and possessing greater body. The development was similar to the last, but the image was of a more harmonious character, the feebler portions acquiring density proportionately with the lights, and withstanding the action of the fixing solution better than the previous ones. This completed the series of experiments with soluble bromide in excess, and the outcome would seem to be that, though none of the results were such as would be practically valuable, the one which offered the highest promise was the last, produced by combining M. Chardon's method of precipitation with the use of an organifier. By comparing Nos. 2 and 4 the action of the organifier becomes evident, but its exact nature it is impossible to define. Whether it acts upon the pyroxyline or the silver bromide, or both, its effect appears to be to preserve the latter in its normal state of fine division, while there is evidence that the pyroxyline is acted upon in the fact of the greater permeability of the resulting film. These experiments, arranged in a more methodical form than we have hitherto attempted, confirm the results we had previously attained, and which have led us, from time to time, to speak in a somewhat disparaging manner of precipitated emulsions.

We have now to turn to the remaining examples prepared with silver in excess, and here, as we have before hinted, we consider that an entirely different principle comes in, or at least that a totally different set of conditions exist. That this is so is proved, so far as our experiments go, by the exact reversal of the order of merit of the two modes of bringing about the precipitation. At the outset we may reject the first two examples (those precipitated with water alone) as entirely useless. The emulsions were in each case grey and poor, devoid of all trace of the characteristics of a workable mixture; the result of development was a thin, foggy image (when an image was obtainable at all), and the film almost invariably left the glass in ribbons upon drying.

The emulsion obtained with No. 3 of this series, which we take as representing Mr. M. Carey Lea's process, was of an entirely different class from any of the foregoing. Of a slightly brown tinge as seen in the bottle, it gave a rich, creamy film of a brown-ruby colour by transmitted light, perfectly clear and free from granularity when moist, and drying partially opaque after the manner of most washed emulsions. In physical properties the layer of emulsion was smooth and hard, and different both from the "powdery" or contractile films as usually met with. As we expected, from the appearance of the emulsion the development was entirely satisfactory, being rapid and regular, though in point of density slightly inferior to an emulsion washed in the usual manner. This, however, may possibly not be chargeable to the fact of its precipitation, but rather to the particular formula adopted in this one case; and it is due to Mr. Lea to remind our readers that his formula was not followed in its entirety, neither iodide or chloride of silver being used, nor did we adopt the organifier which he himself prefers, consisting of gum, gallic acid, tannin, and albumen. Despite this departure from the original formula, it is evident that, even with ordinary pyroxyline, precipitation by his method is successful under certain conditions, namely, an excess of silver in the emulsion, and the adoption of an organifier in place of water with which the precipitation is effected.

The last emulsion on our list, prepared by M. Chardon's method, and using an organifier, differed materially in its results from the last. It was similar in colour and general characteristics, but possessed greater viscidity, flowing less easily, and giving a film which ran in lines and presented a sort of crapy appearance whilst moist, but drying even and transparent. In short it exhibited a greater tendency to horniness than Mr. Lea's emulsion, and gave the impression that it contained a considerable proportion of water. Its appearance, however, was not such as to convey an unfavourable idea of its capabilities, as we have frequently met with emulsions of this nature which worked remarkably well; but we dwell upon these particulars in order to mark the effects of the altered method of manipulation. A comparison of this sample with No. 3, however, showed its inferiority, both in sensitiveness and density; the action of the developer was slower, and with a given exposure less complete. Very great difficulty was experienced in reaching anything like printing density with alkaline pyro., though silver readily produced the desired effect. The only point in which it showed to advantage was in an apparently greater power of resisting fog under prolonged action of the developer; but this may have been partly due to the plates having been, as compared with the others, under-exposed.

In conclusion: we may sum up the results of our experiments in a few words. The two modes of precipitation produce different results. With soluble bromide in the emulsion M. Chardon's method gives the most satisfactory results, while with free silver the opposite is the case. With ordinary pyroxyline precipitation with water alone is unsatisfactory whichever method be followed, though we are not prepared to say that an organifier is absolutely necessary to render the operation successful. We are unable to speak at present of the comparative value of the two modes when used in connection with precipitated pyroxyline, but from M. Chardon's preference for his own method we presume he has found that the best.

EQUALISING INTENSITY IN NEGATIVES.

Sometimes it happens that negatives are obtained in which the relative degrees of intensity of light and shade are so widely different as to entirely alter the aspect of nature. Such a negative we have now before us, taken a few days ago in the neighbourhood of Gomshall.

The scene represented—or, perhaps, more properly, intended to be represented—is a white cottage by a roadside, illuminated by the fierce beams of a midday sun. It is flanked with masses of dark green foliage from stately trees, disposed in such a manner as only to be illumined by the few rays that fell upon them from a clear blue sky, which at best is only a feeble source of light. Here, then, we have in a picture the two extremes of lighting—a white, sunny-looking object very brightly lighted enveloped in a surrounding of a dark colour very badly lighted. Many photographers upon inspecting a scene of this description would wisely shake their heads and pass on in quest of a subject possessing more harmony and feebler contrasts; others, on the contrary, would pause for a few minutes to "have a shot at it," if only on account of the difficulties involved in making the attempt somewhat successful.

It is under such circumstances as those described that the multi-flapped sunshade of Canon Beechey can be introduced with so much effect. With an appliance of this kind—which cannot be too strongly recommended to the notice of every landscape photographer, but with which we were unprovided at the time in question—any unduly luminous object in a scene can be shut out during a part of the exposure so as to enable the more dimly-lighted portions of the view to become impressed, a final withdrawing of the shutter when the dark parts have had time to become depicted enabling the more luminous portion of the view to impress itself and "catch up," so to speak, with the others. All this, however, has reference to prevention; but the negatives having been obtained in all the intensity in which the scene was presented to the visual organs, what is the cure?

There are two methods of chemical masking by which the intensity (not the *density*) of a negative may be reduced, and both of them are based upon well-known methods. Supposing that in the case of the cottage negative the trees are so feebly delineated as not to stand the prolonged printing required to bring out all the cottage details, it is only necessary to increase the density of these feeble parts; and this can very easily be effected by coating the plain side of the glass with collodio-chloride or gelatino-chloride of silver, and exposing to the light which is transmitted through the negative. It will be apparent that in this manner the light will act most rapidly upon the portions protected by the deepest shadows, and by increasing the density of these places the contrasts between the lights and shadows of the picture will become diminished. When this suggestion was first made—by whom we do not recollect—we tried the proposed mask with advantage.

The following method is more manageable—certainly it confers upon the photographer the power of increasing the intensity of the shadows in any degree and to any extent he may think proper:—The back of the glass plate is coated with a preparation, such as the perchloride of iron and tartaric acid mixture recommended by M. Poitevin, which is dry until it is exposed to light, the effect of which exposure is to render it tacky. By exposing through the negative, as before described, this film becomes tacky in the ratio of its exposure to light, and all that remains for the photographer to do is to apply any fine and opaque powder, such as plumbago, to those parts of the shadows which he desires to render more dense by means of a camel's-hair dusting brush. This process is precisely the counterpart of what is so well known as the "dusting-on" process, in which the function of the light is to harden what would otherwise, under certain conditions, become a tacky film—a most valuable method for *increasing* the intensity of a negative, or for giving it greater contrasts.

To those who may desire to make trial of these processes we subjoin a formula for the preparation of collodio-chloride, which we extract from Mr. M. Carey Lea's excellent *Manual:*—Make an ordinary plain collodion with equal parts of ether and alcohol, and containing nine grains of pyroxyline to the ounce. Reserve a portion of the alcohol in which to dissolve finely-powdered nitrate of silver in the proportion of seven and a-half grains to the ounce. This alcoholic solution of silver is not to be added to the collodion until two grains of chloride of strontium and one grain of citric acid have previously been dissolved in it (the collodion). Instead of the strontium the salting substances may consist of a grain of chloride of lithium and two grains of citric or tartaric acid.

THE MEDAL AWARDS AT THE FORTHCOMING EXHIBITION OF THE PHOTOGRAPHIC SOCIETY.

We have reason to believe that both the objects and the system by which medals are to be awarded will give general satisfaction. The jury is to be composed of the President of the Society, two members of the Council, two members of the Society who are not members of the Council, and two artists of high reputation—artists, we may observe, who are not photographers.

We have already stated that twenty-three medals are to be awarded for definitely-stated objects. These are as follow:—

Two Medals—For those pictures which, in the opinion of the jury, shall display the greatest general excellence.
Two Medals—For the best landscapes, 10 × 8 and under, and above 10 × 8.
Two Medals—For the best portraits, 12 × 10 and under, and above 12 × 10.
Two Medals—For the best single figure study, 12 × 10 and under, and above 12 × 10.
Two Medals { For the best enlargement untouched, and
For the best enlargement and *negative* by exhibitor.
Two Medals—For the best *genre* pictures.
Two Medals—For the best photo-mechanical prints.
One Medal—For the best study from animal life
Two Medals—For the best instantaneous pictures.
Two Medals—For the best six stereo. transparencies.
One Medal—For the best frame of dry-plate photographs.
One Medal—For the best microphotograph.

One Medal—For the best specimen of surface printing from metal.
One Medal—For the best apparatus.
Three Medals will be placed at the disposal of the jury for any novelty or other form of excellence in process or result.

We shall not be in a position to announce the names of the jurors until they have all signified their willingness to accept the duty. We venture to predict, however, that the composition of the jury will, when the names are published, be found to give entire satisfaction.

ON SOME PROPERTIES OF GLASS.

Glass—whether in the form of the lens in the camera or the support for the film in the negative, or, indeed, in any of the many shapes in which it is applied to photographic use—is looked upon as a substance of such complete permanency and unalterability that it is possible we may be thought guilty of exaggeration when we say that to find a glass which has a just claim to this popular opinion is very far from being an easy matter. That form in which the unblemished character of glass appeals most to the photographer is, naturally, the negative plate, of which some hundreds of thousands must be used annually; and so much does the common idea rule manipulative practice that it is scarcely too much to say that it is more than likely that the poor, much-abused bath is credited with many a vagary when it is perfectly innocent, and some chemical alteration of the glass is the source of the evil.

That glass is so liable to be altered a little reflection upon the difficulties found in plate-cleaning will show; for, when a case arises where stains, &c., unmistakably point to the glass as the cause, it is evident its surface has not been mechanically abraded or scratched, and the change, whatever it is, must be of a chemical origin, though, possibly, mechanical in its immediate effect upon the deposition of the silver forming the image. We purpose to give some idea of the character of the metamorphosis likely to be undergone by glass when exposed to the action of air or water. Forewarned is to be forearmed, and the deeper we are able to dip into the source of failures the more power do we obtain to prevent them.

Glass forms an interesting example of the fact that, whenever special excellence in a particular direction is to be attained, it must usually be at the expense of some quality or other. The various characteristics of glass—its hardness, lustre, permanency, insolubility, impressibility, &c.—prove this. It is in the main a silicate of soda or potash, or both, having combined with it other silicates, such as those of lime, alumina, baryta, &c. There is a glass made (silicate of soda) which is quite soluble in water—it has a beautiful sea-green hue as generally found in commerce—and between it and the most insoluble varieties, containing silica and aluminium in large proportion, there are all varieties of solubility to be found. Silicates of lime or potash separately are acted upon by water and acids, but, fused together, they are insoluble. The greater the proportion of silica and alumina glass contains the more insoluble it becomes, and it is the manufacturer's province so to proportion the ingredients of his glass as to produce qualities most suitable for the object in view. In this country glass manufactured in Germany, France, and at home is to be purchased, and each has its peculiar characteristics. An extremely pale glass, almost colourless, was imported a number of years ago from Germany; but it gave way to the action of the atmosphere to a most remarkable extent, and we have for some years seen nothing of it.

It has frequently been stated that glass with an artificial surface—that is, one produced by polishing with abrasive powder—is less clean to work and more liable to stain than one with the natural surface first obtained after the sheet has cooled down. Though we believe it quite possible that more has been made of this difference of surface than the actual facts warrant, we can yet easily see why, apart from the supposed hardness of the hypothetical skin, artificially-polished glass should be more readily acted upon by water or other chemicals. This surface being entirely given by a process of rubbing, or, as it were, minute scratching with a powder, it might be supposed that if it could be examined by a microscope it would be found rough like "obscured" glass, and thus offer a greater amount of surface to be acted upon.

The action of water upon glass is to decompose it, the potash and soda and a little silica being dissolved, and the greater the amount of alkali present the quicker is the decomposition brought about. The action of the atmosphere is of a similar nature, the moisture always present to a greater or less degree being the real active agent; the common result is to separate the soda and potash, and to leave the silica upon the surface sometimes in a manner that is only perceptible upon heating, when excessively-minute flakes separate and leave a dull surface. It has been stated that glass buried deep in the earth has been, when dug up, so soft as to be cut with a knife.

The use of soda for cleaning old glass plates is often recommended, and in its way, and with proper precautions, it is very useful; but it is to be remembered that it dissolves the silica of the glass, acting with greater or less effect according to its strength and temperature. If this be borne in mind many troubles will be avoided, numerous cases of ineradicable stains having been traced to overlong soaking in alkaline solutions. If proof were needed of the solvent and injurious powers of small quantities of water, if continued for a sufficient length of time, it will be only necessary to breathe upon one half of a piece of patent plate glass, and, after immediately covering the film of condensed moisture by another plate, to wrap up the two, place in a cold place for a twelvemonth, and then examine. The moistened part will be roughened to such an extent as almost to take the mark of a blacklead pencil. We have seen packets of several gross of plates entirely ruined from this cause; glass plates brought up out of a cold store-room into a damp atmosphere had condensed the moisture of the air upon their surfaces, and the packer had packed them without wiping them, as, indeed, it was scarcely likely he would think of doing. They remained immersed for a considerable time, and when opened were found to have the surface visibly eaten into, not a glass remaining that was fit for use; and there cannot be a doubt that there must be large quantities of glass similarly imjured, though, unfortunately, not visibly so, the mischief only being observed after taking the negative.

Again: if further proof were required of the solubility of glass—that is, its decomposition, which must result in disintegration and thus roughen the surface, if even microscopically, and render it liable to retain foreign matter—it would be found by boiling in a Bohemian glass vessel a weak alkaline solution in which litmus had been dissolved and acid afterwards added to produce a faint reddening. The result would be that sufficient alkali would be dissolved out of the glass to restore the blue colour to the litmus. This same experiment can be proved in a homely way by adding a little red cabbage to distilled water, and boiling in such a vessel, when the distinct blue of the alkali would be given to the water.

We think we have advanced sufficient facts to show that glass is by no means the unalterable substance so commonly supposed. If it induce a little more care in the use of this necessary photographic adjunct our purpose will be served.

One of the most popular forms of camera, if not *the* most popular, at present in use is that which enables the operator to take either a stereoscopic or a single picture upon the same plate, and as sent out by our best manufacturers these cameras leave little to be desired in the way of convenience. Owing to the peculiarity in the shape of the plates to which these cameras are usually adapted, the length being considerably in excess of the breadth, the camera is rarely used in any but what we may term its normal position; that is, with the longest side of the plate in a horizontal direction, the generality of landscapes being more suited to that style of picture than when the greatest length is in a vertical direction. Occasions arise, however, upon which it is desirable to use the camera in the vertical position, and to meet such contingencies the best instruments are provided with an auxiliary tailboard which, in addition to conferring greater rigidity on the whole arrangement, enables it to be used upon its side when desired. All modern cameras, however, are not fitted with this additional convenience, and those of older make are nearly certain to be without it, and in many cases, owing to peculiarities in the construction of the camera, it cannot be applied. Those who are placed in this position may find the following simple arrangement both useful and effective:—It consists of a separate base-board of sound, hard wood, three-eighths of an inch in thickness, provided with a screw and plate to attach it to the tripod head, in the same manner and in place of the camera. In order to impart strength and rigidity, and to prevent its warping, it should be composed of separate pieces, fastened together with a "tongue and groove." To one edge of it is hinged a second piece smaller in size, and so arranged that when opened to its fullest extent it stands perpendicular to the base-board. At a distance from the latter, corresponding with the distance from the side of the camera to the screw plate with which it is attached to the tripod, a hole is bored sufficiently large for the screw to pass through. This, with the extra screw for binding it to the tripod, completes the arrangement. To use it, the base-board is screwed to the tripod in place of the camera, the flap raised, and the camera screwed against that, with its side resting upon the base. The instrument is thus brought into the vertical position, and if everything has been properly done will be at least as firm as when attached direct to the tripod. If the camera be fitted with a swing back, the width of the base-board must be such as not to interfere with the binding screw on the side which comes in contact with it. The whole arrangement occupies but little extra space, and will be found a valuable adjunct when other means are inadmissible.

NEW DEVELOPERS AND MODES OF DEVELOPMENT.

Part I.

There is no phenomenon in photo-chemistry so important or so interesting as that of the development of the latent image. This discovery in its two original forms—namely, development by gallic acid on paper and by mercury on metal—was made in both cases by accident; if, indeed, there can be any accident in careful and intelligent experimenting. In both cases, surfaces supposed to be unacted upon were put aside, and, when casually examined next day, were found to have revealed an image by slow and gradual action.

The characteristic difference between these two developments was that in the one case the developing agent was applied in the form of vapour, and in the other in solution. In the first case—the vapour treatment—no improvement has ever been made in the development; in the second the advance of our knowledge has been singularly slow. To gallic acid pyrogallol succeeded as an agent of a very similar character but greater activity. More than twenty years ago Mr. Robert Hunt suggested the use of ferrous sulphate for the development of wet negatives. The pyrogallol development was improved by the use of alkali in connection with it.

Since the introduction of ferrous sulphate there have been only two new substances capable of development discovered. About ten years ago I found that hæmatoxyline was an energetic developer, and morphia has been alleged to have certain properties of the same sort. A modification in the use of pyrogallol by substituting sodium hydrosulphate for alkali has been proposed by M. Sammann; and it has been mentioned in the columns of this Journal by a contributor (who does not give his name) that infusions of tea and of coffee had been found to develope an image in conjunction with ammonium carbonate.

The facts thus briefly indicated represent, I believe, the sum of what is now known relative to the development of the latent image. In the present paper I shall endeavour to show—

1. That the number of substances capable of developing the latent image is not a small or limited one, as has been generally supposed, but a very large one, including substances belonging to almost every class of chemical compounds.
2. That when the action of a developer is stimulated by an alkali ammonia is not the most energetic agent, but is in most cases surpassed by potash.
3. That the action of ferrous salts on developers is not limited, as has been hitherto supposed, to cases in which a soluble silver salt is present, but there exist ferrous salts capable of attacking the silver haloid itself, as does pyrogallol with alkali.
4. That it is probable that the pyrogallol development may be so modified as to obtain effects more energetic than hitherto obtained.

In all questions of development it is necessary to distinguish clearly between its two forms—that in which the image is superposed upon the film, and that in which it is formed in, and at the expense of, the film. The first is a question of molecular attraction, and the second of chemical decomposition.

When a body passes out of a gaseous or a liquid into a solid form it exhibits in depositing itself a markedly greater attraction for some surfaces over others. Crystals formed in a glass vessel deposit themselves rather upon a string or piece of wood suspended in the liquid than upon the glass. The character of a glass surface may be so modified as to increase the attraction. When a liquid standing in a glass vessel slowly deposits a precipitate, the precipitate will follow all the lines traced on the sides with a glass rod used in stirring the liquid. Everyone of these lines will be marked by a clean, sharp deposit of the precipitate. That the glass surface has really undergone a modification by the pressure of the rod may be made evident by examining it by polarised light, and it is also found that the modified condition may continue for some days before the ordinary state is resumed.

This preference exhibited by particles passing from the liquid or gaseous form into the solid for one sort of surface over another is the cause of the formation of the daguerreotype image, and also of the ordinary wet collodion image. A different view from this (which, I believe, I was the first to advance many years ago) has been taken by some writers, who affirm that the condition of the exposed part of the film is itself the cause (in the wet collodion process) of the decomposition of the silver solution. But if we consider that if the developing solution be not sustained in its action, fogging is liable to ensue—that is, a general deposit of silver over the whole plate—and that the same result follows if an otherwise correct development be too much prolonged, we shall, I think, conclude that the cause of the deposit is wholly in the liquid itself, and that the production of the visible image depends solely upon the greater attraction of the exposed parts for the precipitate as it forms.

The production of an image *in the film itself* by the action of the developer is widely different from this, and it is with the latter form of development exclusively that I purpose to deal in these papers. When an alkaline solution of pyrogallol is applied to an exposed surface it attracts those parts that the light has affected and reduces them, forming a visible image. The nature of the substance of which this image is formed has never been very certainly made out, and probably differs very much with different developers. With *oleic acid*—which, it will presently be seen, is capable in conjunction with potash of developing an image—the material of the image has all the appearance of metallic silver. In other cases it appears to be a sub-salt, and in others elements from the developer may be contained in it. In very many cases the nature of the substance of which the image is built upon is profoundly modified by the action of the fixing agent. I have satisfied myself by actual experiment that sodium hyposulphite is capable of converting an image formed of sub-bromide into one of metallic silver.

The action of these developers with which we have here to do—namely, those which produce an image in the absence of soluble silver salt—is necessarily a reducing one, and it is amongst reducing agents that developers would naturally be sought. But it would be a great mistake to suppose that the reducing power is the only one needed. What is specially wanted is what may be called an *elective power*—a disposition to attack the parts influenced by light, and spare those not so influenced. We may, for example, take a sensitive surface exposed in the camera or under a negative, and apply to it a reducing agent which will slowly blacken it all over, without bringing out a trace of an image; and, what is rather remarkable, a substance may show the elective power just spoken of when applied to one sort of film and not with another. With one sort of film it may bring out a brilliant and clean image, and with another show nothing but fog. It may also happen that one sensitive surface may be most sensitive with one sort of developer and another with another.

As a sensitive surface for the following experiments pure photographic paper was selected; and, as the object was to bring this paper to the highest degree of sensitiveness, I preferred to use all three haloids. I have always found that silver bromide and iodide together were more sensitive than either taken alone; but when used for paper development they were very apt to show irregular action and fog. Having found the utility of a chloride to correct this tendency in bromide emulsions, I tried it also in paper bromo-iodide development, and found it answer perfectly. The negative paper thus prepared was highly sensitive, giving bright, clean, and bold images, and being capable of being kept for some weeks, or perhaps longer, as I observed no deterioration in any case. The proportions of the soluble haloids used were—potassium bromide eight grains to the ounce, potassium iodide two grains, and ammonium chloride one and one-third grain to the ounce. This proportion was uniformly preserved throughout the whole range of experiment.

In some cases an organic substance was added to the film to increase the sensitiveness and brilliancy. For this purpose a decoction of cocculus indicus was employed. When used it was employed together with the haloid solution, and before the application of the silver bath. In all cases the paper was dried before applying the silver bath, and when taken from the latter was first very thoroughly washed and then dried. The washing was very thorough, in order to get out every trace of soluble silver salt in all cases and to remove every vestige of the cocculus solution in those cases in which it had been used.

This removal was especially necessary, because when a sensitive film contains a soluble organic matter there is always a *possibility* that this organic matter may, in conjunction with potash solution, provoke a development. Cocculus has this power; it was, therefore, necessary to remove it perfectly, which was invariably done. Nevertheless, for greater certainty all important experiments made on the cocculus paper were afterwards repeated with paper prepared with plain haloids.

I hoped, before closing my work for the season, to have carefully examined all those developments which succeeded on paper with collodion and gelatine films. The condition of my health has rendered this impossible. I find, however, that it by no means follows that a development which succeeds on paper does also on collodion, and that the number of available developers for collodion appears to be much more limited than for paper. The practical utility of these investigations is, therefore, more limited than I at first supposed it would be. They will, however, be found interesting, as extending the field of information, and not destitute, I think, of usefulness in more ways than one.

1.—Development by Glucosides.

There is a more general tendency among *glucosides* to develope the latent image than amongst any other class of bodies that I have examined. It is, therefore, a little curious that this power does not, in any one case, rise to the extent of promising usefulness. The characteristic property of glucosides is that, under the influence of heat and a dilute mineral acid, they are converted into glucose and a new body, often separating at the same time a quantity of black carbonaceous matter at a temperature considerably below 100° C. It will presently be seen that glucose has but very slight developing power, so that the possession of that power by many glucosides is not in any way connected with their glucose reaction.

Æsculin—a decoction of fresh twigs of the horse chestnut—when applied to the latent image in connection with a weak solution of potash gave a fair development.

Daphnin gave a moderately strong image. When alcoholic tincture of mezereon bark is evaporated over the water bath with dilute hydrochloric acid, *daphretin* is formed (in small quantities). This substance applied to the image with potash shows a higher developing power than daphnin.

Quercitrin (commercial flavin) consists, principally, of quercetin, and appears to possess no developing power; but when boiled for a few moments with very dilute aqueous potash and zinc turnings it acquires some developing power, evidently owing to formation of quercitrin. A decoction of white-oak bark, which contains quercitrin largely, also gave a fair image.

Solanin and *thujin* both exhibited some developing power when applied with dilute potash. On the other hand, *phloridzin*, *glycyrrhizin*, and *colocynthin*, under the same conditions, were inactive.

2.—Development by Sugars.

In the case of almost all organic substances the developing power is best brought out by potash, and the sugars form no exception.

Cane sugar and *glucose* are almost entirely without effect.

Milk sugar produces a light image on a dark ground. It seems to fog the ground and metallise the image. The developing power is by no means great.

Glycocin is without effect.

A very singular contrast to the foregoing is offered by *manna*, which substance, in the presence of dilute aqueous potash, brings out a strong and bold image. Compared with the previously-mentioned sugars its action might be estimated at ten or twenty fold, or, indeed, much more. This remarkable dissimilarity amongst substances so nearly allied as are the sugars led to the consideration that mannite belongs to a different sub-class from the others mentioned, inasmuch as it is not, like them, a carbohydrate, but contains more hydrogen than sufficient to convert all the oxygen into water. The presence of this excess of a very powerful reducing agent like hydrogen seemed to suggest a plausible explanation—to test the correctness of which the action of another sugar belonging to the same sub-class as mannite, viz., *quercite*, was examined. But quercite, tried under exactly similar conditions, exhibited no developing power whatever. This explanation must, therefore, be rejected.

Of the very large number of substances examined at different times manna gives the reddest image. In many ways its action is remarkable.

3.—Development by Ferrous Salts.

Ferrous sulphate has long been known as the most powerful of all developers for wet plates, and yet, at the same time, as perfectly useless for dry development.

To understand clearly the nature of this distinction it is necessary to bear in mind that ferrous sulphate rapidly precipitates metallic silver from a solution of the nitrate, and that this precipitate, while in the act of formation, is attracted by the latent image. On the latent image itself ferrous sulphate has little, if any, action. Its action, therefore, is entirely dependent upon the presence of a soluble silver salt; and when, as in dry development, the silver salt has been removed, ferrous sulphate is inoperative. For example: I have taken paper which had been sensitised and washed, and so exposed under a negative that a development with alkaline pyrogallol brought out rapidly a vigorous image, and then have tried another portion of the same piece with ferrous sulphate, with the result that, after long contact, no vestige of an image appeared. It may, therefore, be said that with ferrous sulphate there is no action on the latent image itself, and the presence of silver nitrate or other soluble silver salt is an essential condition of development.

I state, therefore, an entirely new fact when I mention that *the presence of an organic acid totally changes this relation.* In the presence of many organic acids iron acquires the property of attacking and reducing the latent image in the absence of a soluble silver salt, and so producing a visible image.

Different acids act very differently. I subjoin a description of a few of special interest.

Ferrous lactate (obtained by dissolving hydrated ferrous oxide in aqueous lactic acid) gave a handsome and vigorous development.

Ferrous salicylate (obtained in an analogous manner) gave similar results.

Ferrous succinate also developes very well. It is best to form a slightly-acid solution of succinic acid in ammonia, and then to add a solution of ferrous sulphate in quantity just insufficient to cause a precipitate

Ferrous citrate, tartrate, and formiate also give images, but altogether inferior to the three salts first mentioned.

Ferrous oxalate is the most active of the various ferrous salts that I have tried. It has been known for over thirty years (Mr. Hunt, I think, first observed it) that when ammonio-ferric oxalate was exposed to light ferrous oxalate was formed, and by immersion in a solution of silver nitrate would give an image. Mr. Hunt also tried the two substances on paper together, and obtained images. It was thus known that negatives could be printed on paper prepared with some form of ferric oxalate (ammonia ferric oxalate, for example). By a strong light the ferric oxalate could be reduced to ferrous, and this could be developed by a solution of silver nitrate. But the converse of this—that a latent image on a silver haloid could be developed by a ferrous oxalate—has never been even suspected. Moreover, in these earlier experiments the action obtained from ferrous oxalate was analogous to that belonging to ferrous sulphate, in this—that the silver compound needed to be soluble.

It now appears that almost any organic salt of ferrous oxide will develope a latent image in the absence of a soluble silver salt, and *at the expense of the film itself*, precisely as in the case of the alkaline pyrogallol development.

In development on paper several of these organic salts of ferrous oxide—and notably the oxalate, salicylate, lactate, and succinate—will give very bright and beautiful developments, and this in either neutral or acid solutions.

Although ferrous oxide is quickly precipitated by alkalies it is possible by appropriate means to obtain a strongly-alkaline solution, containing ferrous oxide dissolved; and, judging by what was already known, it seemed altogether likely that such a solution would form a most powerful alkaline developer for dry development. Experiment proved the contrary. For example: if to a solution of ferrous sulphate a certain quantity of tartaric acid is added, fixed caustic alkali may be added till the solution becomes strongly alkaline without precipitating the iron. It would seem as if such a solution ought to be a very powerful dry developer, whereas it exhibited no power whatever. The experiment was varied by preparing a solution containing a large proportion of ferrous carbonate in solution, but with similar results.

I must postpone the conclusion of the investigation till next week, having still a large number of developers to describe. Yet I am very far from having exhausted the number. Experiment in the directions described here, and in others to be mentioned in the second part, will enable anyone to increase the list with new substances capable of exercising the functions of developers, some on paper, some on the collodion films, &c. M. Carey Lea.

ON THE ALBUMEN EMULSION.

[A communication to the Photographic Society of Great Britain.]

Since I understand that Mr. H. B. Berkeley has been referring in his paper to an emulsion process with which I am somewhat connected, I have ventured to offer a few remarks to the Society respecting it. Several friends who have tried it state that there is a tendency of the film to leave the plate, curling up when drying. Except when working with a thick emulsion in which ether was decidedly in excess, or when the pyroxyline was of a very contractile nature, I have never found this difficulty arise. This, of course, may be overcome by using a more powdery cotton and less ether.

I will briefly summarise the method of preparation:—Sixteen grains of ordinary pyroxyline, such as is employed in ordinary collodion for the wet process, are dissolved in six drachms of ether and six of alcohol. In this quantity of collodion are dissolved twenty grains of zinc bromide; one grain of dried albumen is added to this after being dissolved in one drachm of water, in which there may be a drop or two of ammonia (if necessary) to secure solution. The albumen solution must be added carefully drop by drop till an emulsion of albumen is formed. The collodion may now be neutralised by a little nitric acid, and enough silver nitrate dissolved in the ordinary manner to give an excess of at least four grains in the above quantity of collodion over and above that necessary to convert the zinc bromide and bromine and albumen into silver bromide and albuminate. A saturated solution of bromine in water is prepared in the dark, and ten drops added to the collodion after three-fourths of the silver solution has been stirred in. The remainder of the silver is then added. By adding this bromine water nitric acid is liberated, silver bromate formed, and also any sub-bromide of silver converted into bromide. This method of adding the bromine prevents the formation of any appreciable quantity of bromal—a product which is very detrimental to sensitiveness. The emulsion should stand eighteen hours and be then washed and dried in the usual manner, leaving a very slight excess of silver in the pellicle. The pellicle is dissolved in equal parts of ether and alcohol, care being taken to add no more than is requisite, as in a thin emulsion it is difficult to secure intensity. The peculiarity of this emulsion is that a film of it transmits the green and violet rays, absorbing the red to a certain extent. I exhibit a film which shows the peculiarity. This emulsion is very sensitive—chiefly, I suspect, on account of the fine state into which the particles of the sensitive salt are divided; the transmission of the blue and absorption of the red shows the minuteness of the grain. The emulsion is sensitive to the red rays of the spectrum, and also to the less-refrangible dark rays. At the time I was afraid that the heat of summer might alter the plates owing to the dark radiation; but these are apparently so low in the scale that they are ineffectual to cause decomposition. It may seem a stretch of imagination, but the day may not be distant when in a darkened room it may be possible to photograph a black hot poker, or a kettle containing boiling water. W. de W. Abney, R.E., F.R.S.

THE ACTION OF LIGHT, TEMPERATURE, AND ATMOSPHERE UPON PIGMENTED SENSITIVE TISSUES.

[A communication to the Photographic Society of Great Britain.]

The subject I have the pleasure of bringing before you is not by any means a new one, and has, I believe, been introduced to your notice previously, more especially by our friend Captain Abney, who read a paper on this subject in the early part of 1872.

In The British Journal Photographic Almanac for 1872 I also find a paper by Mr. J. R. Johnson, from which I give an extract:—

> "It was reserved to Lieutenant Abney to recognise the full value of this fact, viz., the continuating action of light on a partially-exposed print, and to derive from it most important consequences in actual practice—so important, indeed, that they may lead to a complete revolution in the art of solar printing in carbon.
>
> "Lieutenant Abney having found that the action set up in the different gradations of a photographic negative was continued in darkness in the same ratio, each gradation or graduated tone of the picture continuing to increase in intensity, *pari passu*, with the others, determined, during the dark days of December, to give his prints one-fourth of the actual exposure which experience had found necessary for complete action, and to leave them to mature that action in darkness. Experiment showed him that fourteen hours' darkness were necessary to complete the action set up, and after that time had been allowed to elapse the prints in development were found fully exposed."

I also believe the subject has been treated of more recently by our Hon. Secretary, Mr. H. Baden Pritchard; but at a time when the production of photographs in permanent pigments has become one of the recognised commercial elements in the business of the professional photographer, and taking into consideration the interesting character of the results, I venture to bring the subject before you this evening with a view to afford some data for further systematic experiment.

Pigmented tissues are of two kinds as regards the methods employed of making them sensitive to the action of light. First, those made sensitive by the introduction of the sensitising compound into the mixture of gelatine and pigment used in coating the paper; secondly, those made sensitive at any time after their manufacture by being immersed in the sensitising fluid. But, as the action of which I propose to treat seems to be the same in both cases, I shall make no distinction between them, but simply speak of them as sensitised tissue. In making the material—consisting of gelatine and pigment spread upon paper, which we call "tissue"—sensitive to the light's action, differing results are obtained by increasing or diminishing the quantity of the chemical salt employed as sensitiser; but, whatever be the quantity employed, the beginning of a change is at once set up in the tissue itself, and the gelatine forming the medium for the colour has within it the germ of complete and absolute insolubility, even if preserved from the action of light and air in the most careful manner. But, in the absence of light and air, the oxidisation necessary to secure insolubility goes forward but very slowly, and the tissue may be kept many weeks in a sensitive and even usable condition.

But what I wished to call your attention more especially to this evening is the change that gradually takes place after the exposure of sensitive tissue for a very brief space to the action of the light. We will take for example (say) a negative which, with a given tissue, requires an exposure of six tints. If we take several pieces of this tissue, and expose them one after the other for a very brief period upon our negative—say for *one* tint—we shall have a series of pictures which would be considered very much under-exposed, and if we develope one of these soon after its exposure to the light we find, of course, that it *is* very much under-exposed, and, as a picture, worthless. We find that it is only in the very deepest shadows we get any vigour; that the half-tones will not hold; that they wash away, and the whole is simply worthless.

Now let us cut our other pieces into two portions, distinguishing them by a letter on one portion, as well as the numbers.* No. 1 we have developed, and we know exactly what effect is produced by the brief exposure to light; having cut the other portions in halves, let us distinguish them as No. 2, 2a, 3, 3a, and so on. Put those pieces distinguished by a number into a tin case carefully sealed from the light and as far as possible from the atmosphere; put those pieces distinguished by a number *and* a letter into (say) an ordinary drawer. We thus create separate conditions—one series being kept from the light and to a considerable extent from the atmosphere; the other being kept from light, but in contact with the air, and consequently to a great extent influenced by changes of temperature or hygrometric conditions.

To continue our experiment: let us day after day develope one of the exposed prints, of course developing together the halves that belong to each other, and the results will be eminently instructive.

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* During the reading of the paper Mr. Sawyer drew the attention of the meeting to some excellent illustrations of the continuating action of light on the carbon tissue. The subject illustrating this was an enlargement from a negative of a waterfall embosomed in foliage. There were six prints of the subject, each of which had at first received "one tint," though it should have received "six tints" to have been thoroughly printed; five of these were cut in half, one series of the halves was sealed up in tin cases, and the other halves kept in the dark, exposed to any atmospheric influence there might be. In every case the continuating action of light was most marked in the latter. The prints thus treated had been kept after exposure for one, two, three, five, and eight days respectively. An inspection of the results showed that the print developed immediately after exposure was very much under-exposed, while that which had been kept in the dark, exposed to atmospheric influences for three days, had attained the right depth and furnished an excellent print. The action had continued too long in those kept five and eight days, whilst with the others the continuating action had not sufficiently progressed to yield satisfactory pictures. It appeared, however, that the half which had been kept five days in the sealed tin nearly corresponded with the half kept three days exposed to the air.—Editor *Photographic Journal.*

We shall find that day by day the action of the light will be *continued*—not an universal fogging and decomposition over the whole of the surface, but every gradation of light and shade preserving its proper balance, until at last a point is reached when the picture is as good as possible; that is to say, a photograph in pigmented tissue has been produced by allowing the light to act upon it for only one-sixth of the time supposed to be necessary, the remainder being due to the continuation of the light's action, when the picture is no longer under its direct influence, But it must not be forgotten that our pieces of exposed tissues have been kept under slightly different conditions, both protected from the action of the light, but only one specially protected from the action of the external air. The one protected from the action of both light and air reaches its proper gradation of light and shade much more slowly than the one protected from the light only, showing that other elements than that of the action of the light enter into the making of the picture. The examples that I commend to your notice this evening have been produced in the manner I have described; the two halves of each picture have been joined together, and show in a marked manner the additional action conferred by the atmosphere not being perfectly excluded.

I have said that the moment the tissue is sensitised it contains the germs of its insolubility, and it must not be forgotten that insolubility means the power of producing photographs; it is a very frequent complaint that tissue washes up in development—that the half-tones become chalky and bare. But if the same tissue be kept for a short time it is no longer liable to these defects; it gradually acquires the necessary cohesion of its particles, and the resulting pictures are as perfect as possible.

Far from presenting difficulties, my decided opinion is that in pigmented tissues we have means of modifications and adaptations perfectly unknown to photography before. Not only have we colour —that is to say, the power of using almost any pigment that may be desired—but we have the power of combining pigments, of getting effects of force, that are impossible in any other way. Take the case, for instance, of Turner's *Liber*. It is well known that the deepest portions of these are absolutely dug out of the plate with all the vigour of a master's hand; in the impressions—partly no doubt from the skill of the printer, but mainly from the bold vigour of these lines and touches—they appear almost black upon the sepia ground of the picture. An ordinary photograph would be totally inadequate to represent these; it would make the picture all one tint, but a judicious method of combining colour in the tissue, giving a coat of a suitable dark colour, then upon that imposing a layer of picture colour, enables us to render these dark touches with a fidelity rivalling the best originals. The same principle holds good in many other cases. Given, for instance, a landscape: it is impossible, I will not say to produce natural colours, but to produce a harmonious and artistically-tinted photograph simply by the superposition of colours over each other. To understand how this may be achieved is not difficult. A pigment picture is a picture in relief, the deepest shadows being represented by the greatest thickness of gelatine, the picture being produced under the negative by the light being enabled to penetrate the film according to the degree of gradation in the negative. Suppose, then, we had a tissue formed of say four tints—the lower one a blackish-brown, the next a red, the next a yellow, and the upper one a blue. In the deepest shadows the negative offering but little or no resistance to the light would enable it to penetrate to the lowest coating; the next grade would go more or less to the red, the next to the yellow, whilst the sky, if a landscape, would be represented in blue. The white paper would represent those portions of the negative known as high lights, and would represent white clouds.

It is not my intention to enlarge upon this branch of the matter upon the present occasion, and I must equally decline to treat the question of obtaining a far greater and more exalted sensibility in tissue than we have at present. Suffice it to say that even now it is possible to work tissue having a rapidity five or six times as great as that of ordinary silver paper, and this sensibility is attained solely by the action of light and atmosphere upon tissue sensitised in the ordinary way. The points I wish especially to call your attention to this evening are the continuing effects of the decomposition or insolubility conferred upon the gelatine by the addition of a chromate salt, and to bring before you examples of the practical utilisation of that action in very much reducing the time of exposure of the prints.

In addition, I desire to emphasise most strongly the fact that newly-sensitised tissue is not in the best condition for use; that it frequently produces hard and chalky pictures; that it requires long exposure; and that by keeping for a few days the time allowed for the action of the light may be much reduced, whilst the resultant pictures leave nothing to be desired. This latter part of the subject was very well put by the Editors of THE BRITISH JOURNAL OF PHOTOGRAPHY, in the issue of April 27th.

As the summer is, we hope, now coming very near to us, I may be pardoned making a few remarks upon the special precautions to be taken in hot weather. Last summer a wave of failure swept over carbon printers which engulphed all but a very few; this wave of failure was synchronous with a wave of warm temperature. We may expect, at least hope for, warm weather again, and the necessity for *coolness*, both in the operator and the operated upon, will be manifest.

Keep the tissue in a cool, and not too dry, place. Let the sensitising bath be kept cool either with *ice* in it or ice round the dish; once out of the sensitising bath it is all right at ordinary temperatures.

After the exposure of the tissue under the negative comes the first transfer to the glass or other temporary support. It is indispensable that this water should not exceed fifty-six degrees of Fahrenheit at most. Employ ice here, and do not allow the tissue to be handled with hands; let it be fingered as little as possible. Write up in big letters in your operating and developing room

"KEEP COOL,"

and you will have no more difficulty in working carbon or pigment printing in summer than in winter, and it is quite certain that a supply of tissue two or three days old will yield the best pictures, with a comparatively short exposure.

I hope soon after our recess to bring before you the results of many experiments in directions that I have only just been able to indicate. I believe pigment printing to be quite in its childhood, but that it will grow to the full stature and strength of manhood by the fostering care and careful experiments of many workers.

J. R. SAWYER.

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COLOURED GLASS FOR THE PHOTOGRAPHIC STUDIO.

The following letter appeared in the *Echo* of June 13th, under the heading "Coloured Glass:"—

> "Perhaps it may interest some of your readers to know that, having read and heard of the advantages of coloured glass for growing seeds under, I obtained strips of the following colours:—Blue, yellow, green, red, magenta, and ordinary plain white, and placed them over different partitions of a box, which I put out of doors; and the order in which the seeds sown under them came up was as follows:—1st, ordinary white glass; 2nd, yellow; 3rd, green; 4th, red; 5th, magenta; and 6th, blue; thereby proving that ordinary glass is the best after all the talk about blue glass, which was by far the worst, and continued so all the time I kept the glasses over."

This letter was signed "Agricola."

The observations of the writer of this letter confirm to a marvellous extent the opinion of many who have thought deeply upon a subject which has attracted much attention among photographers, viz., the benefit or otherwise of employing coloured media for lighting the studio.

In the case referred to, viz., the fertilisation of seeds, it would seem that whether of the sun's rays the red or heat-giving, the yellow or light-producing, or the blue or chemical-acting, might be the most useful for the special object in view, the *white*, which permitted the uninterrupted passage of the *whole* of them, proved the most active, and so no doubt it is the same as applied to lighting the photographic studio. By permitting the entry of the full amount of white or ordinary light the greatest activity of the blue or chemical rays is ensured, even though the heat and light rays should enter at the same time. It would seem that any one of the three sets of rays exert their fullest energy and power independent, and even in spite, of the presence of the others.

In using coloured glass as the medium for lighting the laboratory of the photographer, it is well known that glass of a sufficient density of colour (independent of the colouring material employed) must be used, otherwise, although none *apparently* but yellow or red light is permitted to enter, the development of a negative is impossible, and it may require two, three, or even more thicknesses of some kinds of glass to arrest the passage of the chemically-acting rays intended to be excluded. Although the increased density produced by additional increments of the coloured medium increases the depth of the coloured rays, it does not increase their *active force*, although it may increase their *deterrent force as against the others*.

Were not this the case, not only would blue glass be more actinic for the studio than white, but the deeper the blue the more active the light would be, so that eventually we might be working in a light almost dark (to use a Hibernicism), but which *ought* to be more chemically luminous than the brightest daylight. That this is a perfect absurdity none will deny, and therefore it is to be hoped that we have heard the last of the so-called advantages of using coloured, and therefore obscured, light to lessen the exposure in the studio. CHROMIUM.

NOTES ON THE THEORY AND PRACTICE OF EMULSION PROCESSES.

[A communication to the Photographic Society of Great Britain.]

I HAVE been requested by your Council to introduce the subject of emulsions for your consideration this evening. Your Society comprises so many well-known experimentalists in this branch of photography that I hope my notes may provoke some discussion among them; more than this I cannot well hope to do.

I wish, more especially, to direct your attention to the theory of emulsions generally. I will mention some of the rules which have been dictated by the experience of others and the theories by which they are accompanied, introducing a few experiences and suggestions of my own; and will conclude with a few notes on what I consider constitutes a good emulsion and the best method of working it.

As, doubtless, with most inexact sciences, the followers of photography include men holding opinions often entirely opposed to those of others. This is sometimes so remarkably the case that one is led to wonder how such discrepancies can occur; and we can only conclude that, where such complicated agents are employed, and where conditions of working so easily affect the result, widely different opinions are likely to be the rule rather than the exception.

It is by no means improbable that we have not yet formed silver bromide in contact with the most suitable organic substance for the obtaining of the most exalted sensitiveness. How few substances have been employed for the formation of emulsions —a method of working which admits of greater divergence in this respect than the bath processes! It is true, however, that a fairly long list of additions to the collodion emulsion have been recommended from time to time—many of them organic—generally with the object of increasing the vigour of the developed image; but there can be no doubt that certain organic substances are highly conducive to sensitiveness when present during the formation of the silver bromide. Those whose experience with emulsions extends to the formation of them will readily admit this to be the case. They will probably even go further; they will recognise the fact that it is not merely sufficient to form the silver bromide in the presence of a suitable organic substance, but that, also, the organic compound which this substance forms with the silver nitrate must be present in the finished emulsion. I refer especially to washed emulsion, otherwise there will be a loss of sensitiveness, accompanied by other troubles of a mechanical nature. It behoves us, therefore, to keep in mind this fact when making washed emulsion, and not to rest satisfied that all will go well if the silver bromide be merely formed under favourable circumstances.

The influence of the fineness of division of the particles of silver bromide has not, apparently, received much attention, although a fine film is generally preferred. I do not mean in contradistinction to a coarse film, but to a film in which the particles of bromide are microscopically coarser than those in the finer film. There is no doubt that a film in which the bromide is so fine that it appears like a stain, giving a very transparent plate, will yield a negative of the highest density, coarseness of film conducing to the opposite result.

It is my opinion that the fine films bear more forcing without fogging, but that they are not more sensitive than the coarser films.

I rather incline to the belief that an extremely fine state of division is inimical to sensitiveness. That this is contrary to general opinion I am aware, but my experience leads me to this conclusion.

The influence of excess of silver nitrate on emulsions is generally admitted, but the theory of its action appears yet to be a matter for speculation. In the case of collodion emulsion it is commonly supposed to act upon the silver bromide and on an organic constituent of the collodion, the result being either a chemical combination of these latter or a mechanical mixture. Practically we find an increase of sensitiveness and density to be the result of this method, though by long keeping the emulsion arrives at a stage where thinness of image and fog are the characteristics. The thinness is due, I believe, to the mechanical state of the collodion film, whereby development takes place on the silver bromide, unrestrained by the enveloping collodion film.

Excess of silver on gelatine emulsion does not seem to act in the same way as on collodion. We appear rather to obtain an increase of density than an increase of sensitiveness, though there is generally some gain in this direction too. It is, however, a curious fact that a large excess of silver nitrate is prejudicial to sensitiveness—an experience which is borne out by the fact that keeping a gelatine emulsion with excess of silver brings about a loss of sensitiveness, and clearness rather than fog.

The subject appears to require further investigation to prove that silver bromide is acted upon by silver nitrate, *per se*, though, doubtless, an organic compound of silver is formed which conduces materially to both sensitiveness and density; and, in the case of collodion, the film is modified mechanically so as to be more easily acted on by the developer.

In the case of gelatine the film is not affected mechanically; hence we fail to obtain much gain in sensitiveness. It is also possible that the organic reaction is not so favourable as with collodion.

If silver nitrate act on silver bromide when unrestrained by nitric acid, and more slowly when restrained, it is only natural to ask what the compound is which causes such a general darkening of the film on applying the developer. I am not aware of any theory connected with this "fogging action," and I suggest the formation of subbromide of silver. The presence of nitric acid restrains this action for a considerable time, varying with the circumstances of each particular case. But I am much inclined to dispute this theory, and to suppose that a change in the character of the collodion, either chemical or physical, or both, is the cause of this abnormal action. We do not experience this action when forming an emulsion with either gum or gelatine, and though both may be "restrainers" in a sense, it is difficult to suppose that either would entirely prevent the formation of the sub-bromide.

Since writing the foregoing Captain Abney has told me how he believes the sub-bromide of silver is formed in the emulsion. He says that it is formed independently of the silver bromide, which results from the addition of the silver nitrate to a soluble bromide; but I leave it to Captain Abney to make his own remarks on his investigations, which I have no doubt he will do if present here this evening.

I shall be glad if the remarks I have made on some of the theories connected with emulsions receive plenty of criticism from the members present this evening. If photography has hitherto advanced so rapidly, may we not expect even greater things when its mode of working is thoroughly understood? I will now leave this part of the subject, and make a few remarks on emulsions from a practical point of view.

Of course an emulsion cannot be too rapid, provided it work in a satisfactory manner. A very good quality of collodion emulsion may be made by a formula of Captain Abney's I published a short time since in THE BRITISH JOURNAL OF PHOTOGRAPHY. The zinc bromide gives a very opaque film, most valuable for preventing blurring, and doing away with the necessity for backing or dyeing the plates. It is worthy of notice that Captain Abney obtains by his method an emulsion perhaps three times as sensitive as those I have prepared when presumably following his instructions. We have not yet been able to account for this difference; and I hardly think the methylated spirit can be the cause, as it gave with gelatine as sensitive a film as the rectified alcohol. I have prepared an emulsion without albumen, and another with two grains of albumen to every eight grains of pyroxyline, yet I do not find there is much appreciable difference between them.

My emulsions are very opaque; and if the film be partly dissolved by hyposulphite of soda it is easy to see that the colour by transmitted light is orange. Captain Abney's films incline to blue; they transmit the green rays, and he contends that his films contain a finer silver bromide than mine do, and that, consequently, they are more sensitive. My emulsions, however, are more easily worked, density being obtained with the alkaline and the hydrosulphite of soda developers, the latter being used as I shall direct. Good results are obtained by mixing the two kinds of emulsion together.

If the albumen should act by causing a fine silver bromide I find it difficult to account for the thinness of image which Captain Abney's own preparation gives, for fine silver bromide should give a dense image. It seems to me that there must be some other difference between the two kinds than that of the relative fineness of the silver bromide. I am not able to speak positively as to the characteristics of these two forms of emulsion; but Captain Abney, who has tried my emulsion, assures me that my results are entirely different to those he obtains. When making this emulsion I sometimes find that the silver bromide is formed in large clots, which emulsify shortly after the addition of the excess of silver mitrate. This effect is usual when iodide is present in the emulsion; but with plain bromide it is new to me.

It is at the washing stage that one is liable to fail. Widely different have been the methods recommended—from precipitating the emulsion in water to adding glycerine and allowing to set thoroughly. The process which has gained the prize of the Photographic Society of France includes the former method, though, certainly, the pyroxyline is precipitated *before* using it in the emulsion. There is no doubt that the quantity of pyroxyline has much to do with the result, some samples bearing a treatment which would ruin others. Before the days of washed emulsion I made several experiments with precipitated emulsion, but the method did not answer well enough for practical use. Even now, when adding glycerine and allowing to set quite firmly—I may almost say "hard"—I have prepared emulsions which gave films liable to split in all directions when dry. The loss during washing may be about three per cent. It is best to add some gum ammoniacum solution to such emulsions, and to keep them for a week or two, when they will probably work more satisfactorily.

Though I have experimented a great deal with gelatine emulsions I must own that I do not like them so well as collodion. I do not think that they are so manageable in any respect as collodion emulsion, and there is much uncertainty connected with their keeping and with drying the plates. Gelatine has the advantage over collodion in that the ether fumes are absent, and the rapidity is generally greater; but in every other respect collodion is more reliable.

I have experimented considerably with alcoholic gelatine emulsions but without much success, finding that the bromide is precipitated when over (say) fifty per cent. of alcohol is added to the watery emulsion, and it is difficult to get an even film. The bromide appears to remain suspended best in those solvents in which it has been formed.

I also found that if excess of silver be used it is necessary to add it *after* the addition of the alcohol to the washed emulsion, otherwise it is not possible to use so much alcohol without causing precipitation of the bromide. Again: the addition of silver nitrate to the alcoholised gelatine emulsion causes a precipitation of the bromide, and sometimes of the gelatine as well; the former re-emulsifies on converting the nitrate with a soluble bromide. I may say that these results are nearly instantaneous.

I am much pleased with what I have seen of the new developer—hydrosulphite of soda. With the sample of bisulphite I have used I find the following method successful with the plates I prepare by Captain Abney's formula:—Make a stock solution of—

Bisulphide of soda	1 ounce.
Sulphide of soda	80 grains.
Water	4 ounces.

Pour some of this solution into a bottle of granulated zinc; in about half-an-hour decant into another bottle, rinsing out the zinc several times with water, which, of course, throw away. To moisten the plate I use a saturated solution of hypophosphite of soda in alcohol sp. gr. ·823, with ten grains of tannin added per ounce; the plate is then rinsed, and sufficient of the hydrosulphide solution, with four grains per ounce of pyrogallic acid added, is flowed over the plate. The development is slow, no image appearing for two or three minutes, so that a developing dish is useful. I find the sulphite of soda a great advantage; if left out only the high lights take on sufficient density.

This developer gives a good range of half-tone, and does not clog up the secondary lights, as is so commonly the case with the alkaline developer, if printing density be sought by its use.

I may say that the developer may be used alkaline with ammonia, in which case the density is obtained without the sulphide of soda; but the peculiar character of the image is easily destroyed.

The developer appears to act in the ratio, or nearly so, of the actinic effect, and I have no doubt will be particularly suitable for cloud negatives.

I will now conclude this somewhat lengthy paper with the hope that I have not quite exhausted the patience of my hearers. I have had much pleasure in introducing this subject, and I now leave you to pick as many holes as you possibly can in the theoretical matter in the first portion of this paper. Herbert B. Berkeley.

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NOTES FROM AMERICA.

Phototypography in New York.—The "Neglected Method of Intensification" by Means of Copper Bromide.—How to Develope "Liverpool" and other Dry Plates.—Iron Developers.—Precipitates in Collodion.—Looking Back.

We know that there is a large section of our readers eager to acquire information concerning any novelties introduced in connection with photo-engraving and phototypography; and when we inform them that we have now before us a paper on this subject, read by Dr. Adolph Ott at a meeting of the Polytechnic Association of New York, we can readily understand the pleasure that will be evoked by anticipation. Of this paper we shall proceed to give an outline. After a few words of introduction devoted to giving a general idea of this art—one "entirely independent of the wood engraver, which is in so far of advantage as he often fails to give a *facsimile* of a drawing, while the new process, in being dependent only on chemical and physical laws, is bound to give a perfect copy of any picture or sketch that may be desired"—we are treated to some observations of an historical nature, in which the names and labours of Mr. Mungo Ponton, Mr. Fox Talbot, and Herr Paul Pretsch are introduced. Dr. Ott observes:—

> It may be that the great number of artists who are at the disposition of publishers and illustrated journals in the Old World, as well as the prejudices which this innovation met, have also been among the causes that prevented the Austrian inventor to improve on his method. But, supposing even the practical difficulties could then have been removed, it is yet doubtful whether an invention of that kind would have found the necessary encouragement on the other side of the Atlantic. To a keen observer it would seem that the United States offered a more proper field, for that is pre-eminently the land of periodicals, illustrated literature, and reprinting. The commercial world also takes advantage of illustrated catalogues and price lists in a much greater degree, and we see the large firms actually overbid themselves with publications of this kind. No doubt such were the considerations that presented themselves to the gentlemen of the Photo-Engraving Company (Mr. John C. Moss), and the Photo-Plate-Engraving Company (Mr. J. Oesterreicher), the latter of whom is a pupil and countryman of Pretsch, and led them to improve the said invention, and to try with it their fortunes here. They have both solved the problem, and it is not exaggerated if we say that they have thus formed a connecting link between the most important invention of ancient times, the art of Guttenberg, with one of the most interesting inventions of modern times, photography.

At this stage we may observe that the solving of the "problem"—whatever problem may be meant—has not been altogether confined to the enterprising citizens of the New World, inasmuch as for several years photographic engraving establishments have been established in the Old World.

But it may be assumed that the New World processes are different from, and possibly superior to, those of Europe, which have long ago been made public. Let us see the difference between the two systems. Here we have thrown over us the metaphorical "wet blanket;" for we are told that with respect to the method of operating "it is, *of course*, kept secret." We have, therefore, to thank the essayist for nothing. One of the companies above named has, however, presented for publication a memorandum of what is designated "The History of a Plate," which is as follows:—

> The subject—a properly-prepared drawing or print—goes to the photograph gallery, where a negative is made in the usual way, except that it must be more perfect than any other known to the photographic art. The negative having been duly examined is forwarded to the secret department, whence issues a plaster of Paris mould, which is sent to the stereotype foundry. The substance in which it is cast is ordinary stereotype metal with some modifications, the constituents being mixed in our own works. Coming out of the "cast," the rough plate is shaved to the proper thickness, and sent to the printer to be tested. When "passed" it is taken in hand by the "finishers," who are for the most part regular wood engravers, who deepen the wider spaces, and touch up any portions which may not have come out sufficiently perfect. Then "clean" and "file" proofs are taken—the former to be sent to the customer, and the latter, properly numbered, to be pasted in a scrap-book for reference, and the plate is delivered to the "blocker," to be mounted type-high, when, after a final examination, it is ready for use. It may be printed from direct, or, if desired, electrotypes or duplicate stereotypes may be made from it in the usual way.

In the estimation of Dr. Ott the gelatine relief is better brought out by using a very dilute solution of ammonia instead of pure water, and in order to prevent the adhesion of the plaster of Paris the relief plates should be soaked in a solution of protosulphate of iron (forty grains to the ounce of water), to which a little glycerine has been added.

Dr. Ott asks a question as to whether it is possible to obtain also gradations from light to shade—half-tones—in the same manner as in photography, and replies to this query—

> Most certainly; but, owing to the fact that the relief is not in one and the same plane in such a case, a *cliché* or stereotype plate of this kind could not be used in the steam printing press. In the new art these gradations must be produced in *lines;* however, it is already possible, by means of the formation of a grain, as in lithography, to print half-tones directly by the steam press. The grain lies here, as on

the stone, on *one* plane. We shall, therefore, soon have illustrated journals wherein nature is reproduced without the least aid of the draughtsman. What an inestimable boon for literature and science! The most important illustrated journals of the metropolis make already an extended use of photo-stereotyping, at present yet in the manner of xylography; but my hearers present will, no doubt, have observed that the illustrations of European magazines, which arrive towards the end of the week, can be found at the close already in American journals. To the dissemination of art and the artistic culture of the masses photo-stereotyping will be of the greatest benefit, in so far as works of art, which were only accessible to a small circle of connoisseurs, can, ere long, be purchased by almost everybody. Thus one improvement is initiated by another in order to render photography what it should be—*a universal reproducing art.*

Many weeks have not yet transpired since, under the heading of *A Neglected Method of Intensification,* we published an article by Captain Abney on the copper bromide intensifier. Writing on the subject of that article, Mr. J. Carbutt, in the *Philadelphia Photographer*, says:—

This mode of intensification has been in use in this country for some years among those using negatives for photolithography and relief work; how long I do not know, or who is the author of it. I obtained it from a friend in 1874, since which time I have had it in constant use, but I do not think it has been used as strong as recommended by Captain Abney. Finding in my own practice that the use of a solution of nitrate of silver for blackening the whitened image was rather expensive, I sought to obtain a chemical reaction that should still be as effective without the expense, and the following extract from my note-book will explain it:—

"February 19th, 1875.—Important improvement in intensifying line negatives. The cupro-bromide solution given me by Mr. Walker I have modified by substituting a five- to ten-grain solution of Schlippe's salt for the silver solution used to blacken the film. I find a very thin negative only required. It gives the most satisfactory negatives for photolithography and relief-plate work I have ever obtained. It is *most valuable.*"

The formula is:—

No. 1 Solution.

Sulphate of copper	400 grains.
Bromide of ammonium	100 ,,
Water	20 ounces.

No. 2 Solution.

Schlippe's salt	5 to 10 grains.
Water	1 ounce.

The latter strength of salt is for line work, and I find, when both solutions are diluted one-half, and No. 1 only allowed to change the tone of the deposit to grey and not to bleach it, answers well for half-tone negatives.

The colour of the negative is changed to a deep red, and is very non-actinic. It should be flowed, while damp, with a solution of gum arabic as a varnish.

A correspondent of the *Photographic Times* complains that, when trying some of twelve dozen "Liverpool" extra-sensitive dry plates which he had imported, he had great difficulty in getting the negatives taken upon these plates up to the proper degree of intensity. After keeping them upwards of a year he was induced to make use of a different kind of developer from that which had previously been tried, the result being that the image came out clear, strong, and round. The same developer—that of Mr. H. J. Newton—was tried upon other than the Liverpool plates with an equal measure of success:—

The following is the formula:—

No. 1.

Water	16 ounces.
Sal soda	2 ,,
Bromide of ammonium	40 grains.

No. 2.

Aqueous solution of pyro. (say)	20 grains.
Water	½ ounce.

For use take in a wide-mouthed vial sufficient of No. 1 for the plate, mix with it (when the plate is ready) No. 2 (say twenty drops for a quarter-plate); flow on and off till the plate is fully developed.

The energy of the developer can be greatly increased by adding before the pyro. is dropped in three to twelve drops (according to size of the plate) of the following ammonia solution:—

Water	½ ounce.
Ammonia concentrated	½ ,,
Bromide of ammonium	20 grains.

The advantages of this developer are stated by the correspondent in question to be as follow:—

1. It confers, as already stated, the requisite intensity upon rapid dry plates.

2. While possessing all those good qualities which especially belong to alkaline development, it seems also to possess the additional advantages of the iron developer; for instance, the *continuous* strengthening of image which distinguishes iron from alkaline pyro. development.

3. It admits of a shortened exposure, and is readily adapted to a longer.

4. It is economical, as well as requiring little labour in its preparation.

This developer I regard as a real boon and worthy of its originator, who, though not a professional photographer, is a gentleman whose scientific research and freedom from those business cares which wealth confers have given him such opportunities of large and varied experiments in photography that any new results published by him are justly regarded as valuable.

At the last meeting of the Indianapolis Photographic Association the committee on developers gave in their report, in which they stated that encouraging results had been obtained with a solution recommended by Mr. Elliott, in which sulphuric acid and nitrate of potash were used instead of acetic acid. Mr. Potter recommended a developing solution made as follows:—Sulphate of iron and ammonia-sulphate of iron one pound of each, and sulphate of copper four oumces, acidified in the usual way. Mr. Elliott gave a formula for using bromide of potassium in collodion by which all precipitate may be entirely avoided; and by the unanimous vote of the society he was requested to record the same with the minutes of the meeting. It is as follows:—Dissolve the salts, both iodide and bromide, in a small quantity of water, in a bottle large enough to contain the amount of collodion to be made; then take the ether and alcohol, *mixed, pour them into the iodising solution,* and the thing is done. Do not forget to reverse the order, unless you want the precipitate, for, in spite of all the "authorities" to the contrary, you will surely get it.

The St. Louis *Practical Photographer* is about to publish occasionally choice selections of articles pertaining to photography, for the benefit of the student of out art, from a well-selected library (in the possession of the editor), of its early history, with which many of its readers have not had a chance of becoming familiar, and which is expected to create astonishment among them when they come to learn how the early fathers of the art laboured for the success and welfare of photography, and helped to make it what it is today.

REMARKS ON THE SILVER NITRATE BATH.

[A communication to the Photographic Society of Great Britain.]

I regret that I was prevented by circumstances from being present at the last meeting of the Society.

The discussion that has taken place for several consecutive evenings on the silver nitrate bath has been, and must obviously be, most incomplete as long as this subject is isolated from, and is made to form no part with, the composition of the collodion, which, sooner or later, effects the changes that are a source of trouble to photographers.

For very obvious reasons the subject is not likely to be properly ventilated. As one of the largest manufacturers of collodion in this country I must protest against the assumption that a sulphate is likely to be introduced by either want of care in washing the pyroxyline or by its introduction through impurity in the iodising salts employed.

I have always maintained, and a very large experience confirms my views, that in order to obtain the most satisfactory results absolute purity, both in the preparation of the silver nitrate and the water used, is a most essential condition.

As a chemist and practical photographer I set my face entirely against the pump water and sunning process, and will further add that recrystallising silver nitrate does not altogether free it from deleterious impurities, and that distilled water fit for making a bath is not so easily obtained as some may think.

The preparation of silver nitrate bath has been for some years a success with me, commercially speaking; many of our largest photographers avail themselves of the convenience I am able to offer by keeping ready prepared and sending out in a perfect state an article of so much importance.

I have always been careful not to speak at these meetings on subjects bearing on trade manufactures; but on this occasion I have been called out, so to speak, and silence on the subject might be improperly construed.

I have always maintained that neutrality in a silver bath (I do not mean, of course, alkalinity—quite a possible condition when the water is saturated with oxide of silver) is the proper condition for this solution; and, should this state be found unsatisfactory in working, the fault lies either in the light used in the operating-room or in the want of a slight trace of iodine in the collodion. My paper on this subject is tolerably well known, and will be found in my treatise on photography. R. W. Thomas, F.C.S.

FOREIGN NOTES AND NEWS.

SLIMINESS IN THE POSITIVE BATH.—A METHOD FOR OBTAINING A TEXTURE FOR HALF-TONES IN PHOTOZINCOGRAPHIC PRINTING PLATES.

A WRITER in the current number of the *Archiv* says he has heard inquiries made as to the cause of the sliminess sometimes observable in a positive silver bath after prolonged use, and that he has tried several experiments to find out the cause. On carefully examining the different sorts of albumenised paper that passed through his hands he found that some samples contained gelatine, presumably added to the albumen in order to give cheap paper a beautiful glossy surface; and to the solution of this gelatine, which takes place only to a very slight extent with the albumen, he attributes the defect complained of.

In the *Photographische Correspondenz* Herr K. Klic recommends the following instructions for the production of texture on photozincographic printing plates:—Coat a varnished or unvarnished negative thinly with glue, and, when the film of glue has become dry, with a solution of asphalte, to which a few drops of petroleum should be added to prevent the asphalte film from becoming too hard. The coating of asphalte should not be so thick as to prevent the whole drawing of the negative from being seen through it. Then take a burnisher furnished with a row of fine sewing needles, and by moving it along scratch through the asphalte down to the negative a series of parallel lines, guiding their direction by the drawing of the negative. These lines will be all equally strong; yet, when printed from, the lines on the transparent parts of a negative so prepared will be thicker than those on the covered parts. This may be owing to more light falling upon the former parts during the printing than upon the latter. Upon the parts which are quite dark cross-hatchings may be scratched. There is also no difficulty in etching the background or sky in this way with a ruling machine.

Meetings of Societies.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

THE first monthly meeting of the new Board of Management was held at 174, Fleet Street, on the 7th inst. The minutes of the third annual meeting having been read and confirmed, the election of the following gentlemen then took place:—Mr. Cassinello as honorary member, and Messrs. Green, Alder, and Millard as ordinary members of the Association.

A resolution was then brought forward, proposed by Mr. J. Fage, seconded by Mr. Sisman:—"That all members' subscriptions, whether honorary or ordinary, shall date from the first day of the month in which they were elected, and be payable in advance. The secretary to notify each member to that effect as their subscriptions become due."

It was proposed by Mr. Sisman, supported by Mr. Fage—"That the Secretary shall forward all monies above a stipulated amount to the Treasurer on the second Monday in each month."

The members of the sub-committee elected to carry on the duties of the secretary, pending the election, then presented their balance sheet. After being carefully audited the meeting passed it as read, and thereupon the books, &c., were handed to the new officer.

After grants being voted for the several purposes of the Association, a vote of thanks was tendered to the sub-committee, and the meeting was adjourned till Thursday, July 5th.

VIENNA PHOTOGRAPHIC SOCIETY.

AN ordinary meeting of this Society was held on the 3rd April,—Dr. Hornig in the chair. The proceedings were commenced by the admission of four new members.

The President read some intimations about the arrangements for exhibiting at Paris in 1878, and laid on the table a treatise by Professor Cocco, of Cagliari, upon the preparation of pyroxyline, the iodising of collodion, &c., &c. To this pamphlet a letter was appended, in which the author intimated his willingness to communicate his formulæ for a subscribed sum of seventy-five lire (about £3). He (the President) said the writer's proposition could not be entertained, as he was opposed to all such transactions, and they were also contrary to the rules of the Society.

A reprint from the 223rd volume of Dingler's *Polytechnical Journal*, of the article by Professor Gintl, giving an account of Herr Winter's photographic enlarging process, was then laid on the table, the President taking the opportunity to call attention to the great number of unusually large enlargements produced by Herr Winter.

Dr. Schimann showed some reproductions of line engravings, in the production of which Herr Husnik's new paper was used.

A communication from Herr Weitzinger, of Marburg, containing a warm recommendation of finely-powdered colophonium as a retouching powder, was read. The recommendation was based on an experience of several years' use of the powder in question.

A letter from Herr Mayer, of Graz, was then read, in which hypochlorites were recommended for use in washing pictures fixed with hyposulphite of soda.

The PRESIDENT gave an account of a recent interview he had had with the chief of the police, with reference to the prints of photographs which must be lodged at the various *bureaux*, when a picture is registered or copyright claimed, from which it appeared that many photographers had neglected to lodge these specimens, and consequently deprived themselves of protection for their copyrights.

A discussion followed, in which various members gave details of the registration regulations in England, France, and Germany.

Professor Simony showed a large collection of landscapes taken by him on dry plates during a tour amongst the glaciers of the Dachstein last July.

Baron SCHWARZ-SENBORN called the attention of the meeting to the historical display which was being arranged for the opening of the new Academy of Art. On that occasion many previously-unknown art-treasures in the possession of private individuals would be exhibited, and on the dispersion of the collection most of them would return to their former obscurity. He therefore hoped the members of the Vienna Photographic Society would take advantage of the opportunity to reproduce any interesting paintings exhibited, and thus make them accessible to the general public. He (Baron Schwarz-Senborn) then went on to speak favourably of the numerous prizes offered by the French "Société d'Encouragement" for the imitation of a similar society, called the "Industrial Society of Lower Austria." The French society had offered for the following six years (1877-1882), in prizes varying in amount from 500 to twelve francs, an aggregate sum of 106,000, for which foreigners as well as natives might compete. He further spoke of the use which might be made of photography in the production of patterns for the manufacture of laces, &c., and showed some examples; then, having the "ear of the house," so to speak, he discoursed of the important *rôle* played in England, France, and the United States by the magic lantern in scientific demonstrations, and thought that useful instrument was too little used in Germany for educational purposes.

In the course of the discussion which followed,

The PRESIDENT remarked that the usefulness of the magic lantern as an educational agent had been recognised for many years by the Vienna Photographic Society, and that by offering prizes for lantern slides they had given a solid proof of their appreciation of the lantern. He also laid on the table a copy of the first number of Liesegang's quarterly magazine, the *Laterna Magica*, and a copy of the Philadelphia *Magic Lantern.*

Herr RITTER VON STEFANOWSKI gave an account of a carbon-printed substitute for the expensive etched borders for carbon transparencies.

The meeting was shortly afterwards adjourned.

Correspondence.

PERMANENCY OF CARBON PRINTS.

To the EDITORS.

GENTLEMEN,—Perhaps you will allow me to make one or two remarks in reply to a letter from your correspondent "Vox" in last week's Journal.

To my mind there seems to be a vast amount of difference between the fading of silver prints and the fading of carbon prints. I must confess that I have seen specimens of each; but, whereas silver prints are known to fade from a variety of causes—some altogether beyond the control of the photographer—carbon prints seem to fade, and *do* fade, from one or both of *two* causes, which ought not be a difficult matter to obviate. Either the pigmented tissue from which they are produced is composed, partly or entirely, of fugitive colours, or else the bichromate solution, *not being thoroughly washed out*, has its baneful effects upon the prints themselves as well as upon the fingers of the operator.

That certain silver prints have kept fresh and beautiful for a great number of years I do not intend to deny, and, for my own part, I think that carbon will never entirely supersede silver; but if, by using carbon, we can obtain *more reliable* results, then by all means let us discard silver. I may be wrong, but I do not believe that the purple tissues manufactured for "chromotype" printing are composed of absolutely permanent pigment. I do, however, believe that the Autotype Company *can* manufacture tissue in a *variety of permanent colours*, such as combinations of blacks, browns, and reds which, besides being beautiful, are most appropriate. In my opinion purples are detestable.

I have seen some pictures by an eminent photographer of this city, printed in "autotype"—*not* "chromotype"—of a beautiful brown colour; and I do not believe it would be possible to produce anything so fine by any other method.—I am, yours, &c.,

Manchester, June 19, 1877. WARWICK BROOKES, JUN.

SHEFFIELD PHOTOGRAPHIC SOCIETY.—In a note from Mr. W. Dakin he says:—"On Thursday, the 14th inst., the members of our Society had their second excursion this season to Roche Abbey, the beautiful ruins of which afforded ample scope for our cameras. Only one member worked wet plates (15 × 12). Altogether sixty plates were exposed; and, as the weather was all that could be desired, with perhaps a little too much wind, I have little doubt that we shall make a creditable show at our next meeting. The dry plates used were *all* 'Liverpool' commercial, or 'Liverpool' emulsion plates. We stopped on the way back to have a 'shot' at the beautiful old church at Maltby. The drive home was magnificent, and each member of the party expressed himself as delighted with the 'out.' Our first excursion this season, three weeks ago, was to Haddon Hall, Derbyshire."

THE LATE COLONEL SIR HENRY JAMES, C.B.—Within the past week has occurred the death of this gentleman, whose name, several years ago, was better known to photographers than it has been of late. It is well known that he was at the head of the Ordnance Survey at Southampton, in which capacity he introduced the now well-known process of photozincography, for reproducing in *facsimile* various works of interest, such as the *Domesday Book*. It was in his annual report on the progress of the Ordnance Survey during the year 1859 that Sir Henry James published a copy of a deed of the time of Edward III., and described the process by which it was produced, which he named "photozincography," at the same time stating that the process was equally applicable in connection with the lithographic stone as with the zinc plate, or for the transfer of the chromo-carbon print to the waxed surface of a copper plate. It will be seen from this that Sir Henry James has left his impress upon our art-science.

THE COLOUR OF AN EMULSION FILM.—The colour of an emulsion, as a rule, has been supposed to be a test as to its quality and sensitiveness, and it has usually been insisted upon that a film which transmits the orange rays alone, absorbing the green, blue, and violet, is in a fair way to give a good image on development. It must not, however, be forgotten that this test is by no means theoretically certain. The colour which is transmitted through an emulsion film depends on causes which are partially, at least, independent of the light which the sensitive salt can absorb. The transmitted light is dependent to a large extent on the size of the *particles* formed, whereas that transmitted through a transparent body is probably dependent on the quantities of the ultimate molecules. The difference will be readily understood when we say that it is possible to form an emulsion through which only red rays can pass, and which is formed of matter which, before being divided into small particles, allows every colour of the spectrum to be transmitted. In considering, therefore, the probable effect of the colour of an emulsion, it is necessary to divide the causes of such colour into two classes:—First, those which are entirely dependent on the absorption by the emulsified matter itself; and, second, those which are due to the scattering of the particles into which such matter is divided.—*Photographic Journal.*

ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

G. MURDOCK inquires "what is a *glace* portrait?" In reply we say that the term is used in America to distinguish a cameo vignette having an enamelled surface.

G. B. SINCLAIR.—To remove the copper from the nitrate of silver, fuse the whole mass of crystals by means of a moderate heat. Then dissolve in distilled water and filter.

R. L. FREEMAN.—Felt of a kind admirably adapted for filtering silver solutions or collodion is manufactured and sold by Messrs. Whitehead Brothers, Endell-street, Long Acre.

L. O. S.—Having sensitised a sheet of albumenised paper in the usual manner, float it for about a minute upon a twenty-grain solution of citric acid. This will give a paper that will retain its whiteness for the time specified.

J. R. T.—Tartrate of lead may be prepared by pouring a solution of tartaric acid into a strong solution of acetate of lead. The tartrate of lead is precipated as a white powder, which, after being washed with water, is dried.

R. TINDALL.—There is no doubt that the stains are produced by the action of impure water; indeed this is thoroughly proved by the fact of protected parts having escaped discolouration. It is probable we shall embrace an early opportunity of making some remarks on the subject.

C. W. L.—The dark slide was removed from exhibition a fortnight after the notice appeared. We are not aware who is the maker of such slides, but we do not doubt that its fabrication is within the powers of any skilled cabinet-maker. We quite agree with you as to its compactness and convenience.

N.—It will be better to have sliding frames in the roof, constructed in such a manner as to be capable of being pulled aside when it is desired that a beam of pure sunshine should be thrown upon the picture or engraving to be copied. If you explain to a clever house carpenter what is required he will be able, at a probable expense of £6, to effect the necessary alteration.

J. W. L.—The most useful camera will be one with a bellows body—*not* of the Kinnear form—for plates about 7½ × 5 or thereabouts. It should have a central division capable of being easily removed, and must be fitted with one lens to cover the full plate, in addition to a pair of stereoscopic lenses, all of which should be screwed, side by side, upon the front of the camera. This we find to be an exceedingly handy system. With respect to the process, we unhesitatingly recommend, for the purpose in question, the "washed emulsion" method of preparing plates as that which, under the circumstances described, will afford the most satisfaction.

H. and V.—The spots on the prints are caused by the settling down upon the paper of some deleterious body, probably lime. But as there are so many agents by which such spots may be produced it is exceedingly difficult to indicate with precision any one cause. We have known them to have been produced by a parcel of chloride of lime upon a shelf in the room in which the printing operations were conducted.

LEWIS GOLDING.—To remove the varnish from the negatives pour over them a little of the following solution:—

Alcohol	1 part.
Caustic potash	1 ,,
Water	10 parts.

By pouring this on and off for a short time the varnish will be dissolved off. The film must now be carefully washed with water, after which the further intensification may be proceeded with, in the *certainty* that it will be as successfully effected as if the negative had never been varnished.

REV. GEO. ROGERS.—You may easily extemporise a Ramsden eyepiece for focussing. It consists of two plano-convex lenses mounted one at each end of a short tube, flat sides out, the distance between the lenses being such as to cause the lens farthest from the eye to be about an inch, or less, from the surface of the ground glass when distinct vision is obtained. Of course there are definite rules for guidance in the construction of Ramsden eyepieces, and these have been published by us; but for your purpose delicacy of adjustment need not be considered a desideratum. The refinement of focussing glasses must, however, be sought for in the compound system of eyepiece constructed on the principle of the compound microscope, or the terrestrial eyepiece of a small telescope.

C. B. B.—1. If the plate has to be kept in a wet state for an hour it is necessary that a collodion of a somewhat spongy or "rotten" texture be employed. It will also be well to immerse the plate, after being sensitised, in a flat bath containing as small a quantity of distilled water as suffices to merely cover the surface. The effect of this is to reduce the strength of the nitrate of silver left upon the film. If the dark slide be well made, a plate that has been prepared in the manner indicated will, if backed with wet cloth or blotting-paper, remain quite good for at least an hour. The dark slide is assumed to be wrapped up in india-rubber cloth.—2. Stillman's tent is very portable; but so are several others which are being manufactured and sold by various dealers.—3. We do not usually reply to correspondents who abstain from enclosing their names—not necessarily for publication.

E. BARRY.—Our correspondent expresses a difficulty in the *art* aspect of photography which he has encountered. We give an extract from his letter, in the hope that some who have had experience in retouching may smooth away his difficulties:—"I can retouch very well, as far as mere smoothing over the complexion goes, adding high lights, &c., but what I do not understand is how to alter the expression from a stern to a pleasant one. I have read as follows:—'He will learn to make these alterations with facility—such as the fixed, staring, and unnatural look which so many persons assume while sitting for a portrait, into an easy, natural smile; or to change the forced, sinister smile assumed under the same conditions into a calm and pleasing expression' (Burrows and Colton's *Manual*). I do not find in this book any directions for doing this except slightly curving the furrow running from the nose to the mouth, which they say will give a *somewhat* better expression. I believe that expression is in the mouth, eyes, and brows principally, and what I want to know, and I think many others would also like to know, is what to do in order that the remarkable changes quoted above may be effected by retouching. If you, or any of your kind correspondents, would enlighten me I should esteem it a most important favour; because if I can acquire such a power over the expression of my portraits it must lead to increase in my business, as I regard an otherwise perfect portrait, but without expression or with an unpleasant expression, as perfectly valueless. Unfortunately, in spite of a genial flow of pleasant talk, &c., &c., our sitters do persist frequently in assuming unnatural expressions. What books could I study to acquire the knowledge that portrait painters have in what consists expression? Plates of the same face showing the different effects of grief, anger, fear, hope, joy, &c., &c., would form most useful studies. Where can I procure such?"

METEOROLOGICAL REPORT.

Observations taken at 406, Strand, by J. H. STEWARD, Optician.

For the Week ending June 20, 1877.

THESE OBSERVATIONS ARE TAKEN AT 8.30 A.M.

June.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks
14	30·13	E	56	62	71	52	Cloudy
15	30·19	E	58	63	76	52	Cloudy
16	30·18	E	59	65	79	52	Cloudy
18	30·05	E	61	69	85	54	Fine
19	30·11	E	61	71	85	60	Fine
20	30·10	SE	60	63	76	58	Dull

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 895. Vol. XXIV.—JUNE 29, 1877.

HOW TO RAISE THE STANDARD OF DRY-PLATE RESULTS.

Only a few years ago it was accepted as a fact, even by dry-plate workers themselves, that the results obtained with that description of plate were necessarily inferior to those produced by the wet process, both being worked by proficients; but the rapid advance made with the former method during the last six or eight years has considerably reduced, if not altogether removed, the gap between the two. Though at the present time the greater number of first-class pictures are produced by means of wet plates, it should be borne in mind that these are chiefly the production of professional photographers, or of those amateurs who are able to afford the time and expense, and are willing to devote a very considerable amount of energy, to the thorough working of the process with the best of appliances of every description. Add to this the fact that the result of a wet plate is known before leaving the spot—and a careful worker is unlikely to carry away any but a perfect negative—we have a further reason why the percentage of really first-class work should be larger with wet than with dry plates.

Amateurs working the latter form of plates labour under various disadvantages, chief among which is the uncertainty arising from the absence of any means of judging to a nicety in the matter of exposure. Dry-plate amateurs, too, belong chiefly to that class who are compelled to snatch a few hours, or perhaps days, from business at rare intervals, and who are, therefore, scarcely upon even terms with others who are more frequently, or perhaps continually, at work, nor are they able to devote as much time and care to each individual picture. In spite of these drawbacks, however, there can be no doubt that the work of some of the best workers of dry plates will compete worthily with the best wet plates. "What man hath done, that man can do again;" and it is at least encouraging to those who prefer the more convenient system of photography to know that their productions, though inferior to wet work, are not necessarily so from any inherent defect in the process.

What, then, constitutes the difference between the results of the two methods? This is a question probably more easy to ask than to reply to; but there are sundry and various matters connected with the details of dry-plate work a study of which may at least tend to bring about a nearer approximation to the standard of perfection. Comparing the two methods we cannot fail to be struck with one great point of difference; for, whereas, thanks to the energy of dry-plate experimentalists, new processes are being continually developed, and modifications of the principles and manipulations introduced, if we turn to the wet process with the bath we find that, with the exception of the introduction of bromo-iodised collodion and iron development, no changes of importance have occurred since the process was first made public.

It appears, then, that the wet process owes its superiority to the large amount of care which has been devoted to it during a long period signalised by no important variations in the details or formulæ, the inevitable result of which has been a thorough mastery of its practical application. As regards the theoretical side of the question, it is, perhaps, no farther in advance than its opponent. It would further appear that until dry plates arrive at such a point that further alteration ceases—at least, for a time—their full capabilities will not be developed, owing to our inability to devote an adequate share of attention to the purely practical portion of the process. We have abundant evidence that steady application to one method in photography, as in other pursuits, will bring about results otherwise unattainable; and when theory shall come to a standstill and the whole attention be turned to practice we anticipate that dry-plate photography will take a position unthought of a few years ago.

Pending the arrival of that period, however, let us consider in what direction it behoves us to turn for immediate improvement. We may take it for granted that the dry plates now in use are, as we have said, capable of producing results, if not quite as near perfection as it is possible to attain, at least far superior to what are now obtained in ordinary work. Our object, then, is to turn those capabilities to the best account by a more careful study of the relation of exposure to development, and of the best methods of conducting the latter operation under different conditions. As our readers are well aware, great stress is laid upon the latitude which exists in the matter of exposure when dry plates are in question, and this, no doubt, forms one of the greatest recommendations in their favour; indeed, we may say that without this latitude dry plates, for obvious reasons, would be practically useless. But we are by no means sure that it is an unmixed advantage; for we are strongly of opinion that the knowledge that very considerable errors in exposure may be rectified in development gives rise to a great amount of carelessness not only in exposure but also in development—that, in fact, what should be, and indeed is, an undoubted advantage is actually one of the greatest drawbacks. Were the exposure of dry plates a matter of as great nicety as in the case of wet we should have a corresponding amount of attention given to it, and, we may presume, an improved class of result.

In development, too, rule-of-thumb and haphazard are, we fear, too prevalent. One manipulator has the same formula for every class of picture and for all exposures; another has no formula at all, but dashes on a mixture of some sort to commence with, and waits to see the result, finding when too late that the *character* of the picture is formed beyond alteration, and that character almost invariably a bad one. It is all very well to talk about latitude of exposure and development; they exist certainly, but those who know anything about the matter at all know that, *cœteris paribus*, every variation of exposure requires a corresponding change in the mode of development, and brings about a different result. To produce the best result possible—that is to say, in order to enter into competition with wet plates—the exposure must be made within very narrow limits, and the development arranged to suit it. On either side of the limit of best exposure a pretty wide range permits of passable results, and hence it is that, failing the exercise of a proper amount of care, we meet with so large a proportion of mediocre pictures, with here and there one of a better class, which probably puzzles the operator to explain how it came to be better than its fellows; it never strikes him that he has made a mistake and given the correct exposure.

Here recurs the difficulty of correctly timing the exposure, which, we fear, can only be overcome by a careful study of the subject, combined with an intimate acquaintance with the various effects of light and their value. This, of course, involves considerable practice and observation, and even then is liable to uncertainty. But there is no "royal road" to success in this any more than in other matters; and all that can be done is to exercise the judgment to the utmost, and to draw as little as possible upon the "latitude of exposure." Though over-exposure is in its way as objectionable as the reverse, it is on the whole preferable to err on that side, albeit the general failing is in the opposite direction. The popular desire for rapidity leads too often to failure, and will continue to do so until some reliable standard of negative is adopted. The practice, on the part of writers, of claiming for this or that process a degree of rapidity so many times less than wet plates is very liable to mislead, especially as the exposure given as sufficient is such as is found capable of producing a certain amount of detail *in the negative.* Now it is quite possible to have a negative full of detail in every part, but which, owing to insufficiency of exposure, is quite valueless for printing purposes. After all, the ultimate use of a negative is in the production of prints; then of what advantage is the detail if it be too feeble to print? Such negatives may be, to the inexperienced eye, very "pretty;" but it is scarcely fair to mislead by claiming a degree of rapidity which is really only sufficient to produce a positive picture. A "pretty" negative is, in nine cases out of ten, to use a vulgarism, a "fraud;" but amateurs, for some inexplicable reason, will persist in striving after them to the detriment of their prints. One of the best *printing* negatives we ever saw was of such an unwholesome-looking character that it might well have been passed into the washing trough as a dirty plate. It is neither necessary nor desirable that negatives should all partake of that character; but the rage for clear glass shadows and delicate, *unprintable* detail is much more to be deprecated.

Over-exposure, if not too great, is manageable, but if carried beyond a certain point the finer detail is lost entirely, and the result becomes flat and devoid of contrast; or, probably, a very large proportion of the restraining agent is necessary during development in order to keep down fog, and we thus obtain dense shadows, heavy half-tints, and snowy lights. By the exercise of an ordinary amount of care, however, these extremes may be avoided, and by giving a full exposure tolerable certainty is secured.

The alkaline mode of development, which is now generally employed offers very great facilities for remedying errors in exposure; but its action is little understood by the generality of amateurs, while those who do understand it, and who know what it is capable of doing, are too prone to expect more from it than it will perform. For example: it is the prevailing custom to employ alkaline pyro. solely both for development and intensification—a practice which, we have frequently pointed out, is not at all times judicious. We do not deny the quality of the results which may be obtained by this system; but we maintain that the margin of exposure which is found to give the highest class of results is considerably narrowed thereby.

We need not here recapitulate what has been previously said with regard to the difference between alkaline and silver intensification and the results obtainable with each form; but it may be taken for granted that each has its own peculiar conditions under which it produces a better result than the other. There can be no greater fallacy than to suppose, as was formerly the case, that the employment of silver intensification necessarily entails hardness. True, under certain conditions such a result ensues, as when the exposure has been insufficient or too large a quantity of silver used; but when properly conducted the most perfect softness is obtainable, combined with a degree of brilliancy and "roundness" only obtainable under the most favourable circumstances with alkaline pyro.

In our own practice we have for some time entirely discarded the latter for, strictly speaking, intensifying purposes, only continuing its use until a sufficiently dense image is obtained to form a basis for the deposition of fresh silver. If the alkaline-formed image be too thin the silver does not act upon it readily, and the deficient action is most noticeable in those parts which require reinforcement to the greatest extent. It is desirable, therefore, to carry the development with alkali partly into the stage of intensification, and it is, above all, important that the detail be well out. It is immaterial, provided the image be clean and free from fog, if it should appear flat; indeed it is necessary that such should be the case. The subsequent intensification acts more energetically upon the better-exposed portions of the pictures and promotes contrast, while the details, being already well defined and vigorous, prevent any appearance of harshness. Intensification after fixing is advantageous under apparently widely different circumstances. A thin, clear image, full of detail, and a flat, heavy picture, with a tendency to fog, are equally improved; but the result is, probably, in both cases to be ascribed to the reduced liability to abnormal reduction. The action of the pyro. and silver after fixing appears also to be more energetic, and where the reinforcement of an unfixed film is tardy or difficult it is often advisable to fix, wash, and then resume the intensification. We shall have a few words to say upon this latter form of intensification at a future time, the length of the present article rendering it impossible to enter upon the subject now.

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STEREOSCOPIC RELIEF IN MICROPHOTOGRAPHS.

It is not improbable that the announcement of a prize being offered by the Photographic Society of Great Britain for the best microphotograph will act as an incentive to those who may be halting between two opinions concerning the production of photographs of this kind for the forthcoming exhibition. To those feeling an interest in practical microphotography, whether they be intending exhibitors or not, we purpose giving a few practical suggestions and hints regarding this branch of science, although in connection with a certain department about which little appears to be known—that of producing stereoscopic effects in the enlarged images of minute objects to be pictorially delineated.

It is commonly believed that in order to obtain stereoscopic microphotographs a binocular microscope is essentially necessary. From what follows it will be seen that not only is this instrument unnecessary for the production of that class of work, but that in a majority of cases better results can be obtained without than with such an appliance. It is necessary that in all descriptions of binocular photography both images should be photographed under precisely similar optical conditions. In the case of that form of binocular microscope which has attained the highest measure of popularity in this country such conditions are not possible, because of the dissimilarity of the images, one of them having to be transmitted through a prism, in the course of which it undergoes two reflections, while the other is projected onwards without having to undergo such treatment.

There are two other forms of binocular instruments in which both the dual images are necessarily similar, namely, those of Nachet and Stephenson. In these the deflecting prisms are constructed in such a manner as to render both images strictly identical. But, however perfectly they may be constructed, they are still open to two objections—that of not being much used in this country, and of necessitating the formation of each of the images with only half a lens, or, at anyrate, with one half of the objective. In a method we adopted several years ago these drawbacks are entirely eliminated.

A single-barrelled or monocular microscope of any convenient form must have fitted to it a super-stage attached to the main stage, and capable of being influenced by the rectangular or mechanical adjustments of that stage. This super-stage is so constructed as to allow of the small platform upon which rests the object slide to oscillate from right to left within a limited sphere. This is easily effected by having the slide-holder pivoted at its two sides into guiding side pieces, the axis of motion being adjusted in such a manner as to nearly, if not quite, coincide with the object to be photographed.

The super-stage having been depressed at one side, a photograph of any suitable object is taken; after which, without moving the light, the camera, or any of the lenses, a tilt in the opposite direction is given to the stage, and a second photograph taken. The pictures obtained in this manner, when combined in the stereoscope, will show an amount of relief very astonishing.

The nature of the action by which this stereoscopic effect is obtained will easily be understood from the following illustration, which will approve itself to the ordinary, in contradistinction to the microscopic, photographer:—At the distance of a few feet from an ordinary portrait camera let a bust or statuette be placed on a table. Now take a negative of the bust, and then, without moving the camera, or doing anything else than *very slightly* rotating the bust on its axis, let a second negative be taken. Prints from the negatives thus obtained will possess all the solidity of binocular pictures if examined in the stereoscope; nay, not only so, but unless special care have been taken not to move the bust too much when rotating it between the first and second exposure, the effect of relief in the stereoscope will be much exaggerated.

WORKING IN HOT WEATHER.

Though it may be thought that this topic has been written and talked about till it has been utterly exhausted, we yet hope to write enough to interest some considerable number of our readers, amateurs and professionals, by a brief allusion to the more useful and really possible alterations of practice desirable during the continuance of such tropical heat as a few days ago was felt through the whole of the country. Mr. J. R. Sawyer's very apposite words recently uttered at a meeting of the Photographic Society of Great Britain might with advantage be repeated to every photographer in the kingdom, and if acted upon much benefit to work in general would accrue.

The first and foremost consideration ought to be the question of the operator's health. We should be afraid to guess at the number of small, comfortless, stifling dens called "dark rooms" there are to be found in studios of some pretensions, inhabited for the major part of the day by hard-working operators, who, in many cases, shrink from complaining to their principal, and in others know that it is useless to do so, as the space at command will not admit of a change being made. Yet no greater mistake could be made than to build the dark room so as to be uncomfortable for the operator. The lassitude induced, followed so often by ill health, must tell against excellence of results.

It is our strong advice to any photographer contemplating alterations to see that his dark room is as large, lofty, and well ventilated as possible; more work and better work will be the result without any increase of staff. A point of considerable practical importance in connection with the photographer's health is a suitable means of quenching thirst during hot weather. Too often have ardent spirits been resorted to. Nothing can be worse, as we have before pointed out, the system being rendered so much more susceptible to the mixture of the injurious vapours in the room. All spirits should be avoided, but, if stimulants be thought necessary, we may instance the case of several photographers whom we know who recommend an occasional draught of "Bass's ale," and who consider it rather beneficial than otherwise. We, however, strongly recommend a beverage composed of equal parts of milk and soda water. It is refreshing and gently stimulating; few who try it use any other. The apparent expense is reduced to a minimum if a gazogene be used for producing the soda water. We were much amused the other day to observe how a photographer "iced" his soda water. He took as much "hypo." as he considered he should require for the day's prints, threw the crystals round the soda-water bottle placed in a tall jar, and then poured in sufficient water to cover them. The cold produced was almost equal to freezing water, and he thus economised time while imparting the desired coldness to the refreshing draught.

Mr. Sawyer has given some excellent advice recently with regard to carbon printing, which, of all photographic processes, is most liable to misfortunes when hot weather comes upon us. There are, and naturally, many experimentalists to whom ice for photographic purposes is quite out of the question; and, though large users of tissue would not feel its cost, it would be a matter of some moment to the few whose use at present is confined to occasional experiments and to them the process would be a forbidden one. But there are few places where, within reasonable distance, access to a pump cannot be obtained; and we may say that almost any pump water would be sufficiently cool for the carbon process. The sensitised tissue, unlike albumenised paper, being really improved by keeping, it is not imperative, nor, indeed, to be recommended, to prepare it early in the day. Let it be prepared in the evening, the last thing before finishing work, if it has to be sensitised in the same room as the silver. It will thus be preserved from dust, and if the temperature be high, and fears entertained of too quick drying, a thorough watering of the floor will be of great benefit in lengthening the time of drying, the tissue also being hung *low down* instead of near the ceiling. It should always be remembered that upon judicious sensitising and drying of the tissue depend in great part the success of the subsequent operations.

In silver printing it must not be forgotten that increase of temperature is equivalent to strengthening the bath, and hence it will be necessary either to float for a shorter time or to work with a weaker bath, otherwise the prints will have a metallic, crude tone, with bronzed shadows. Where the requirements of the establishment allow its being done, it is far better to sensitise only for immediate use, fresh sheets being prepared at intervals during the day. We would also add that on no account do we advise the printer to follow the recommendation, so often given, to put a little acid in the bath to preserve the whites.

A *tin* box, with a well-fitting—not necessarily tight-fitting—lid, will be found much better than the usual wooden drawer or box for preserving the prints in till they are ready for toning; their whiteness will be preserved to a far greater extent. If the utmost purity in the whites be desired the use of carbonate of soda paper in backing may be said to be imperative, except in those few large establishments where toning is going on all day, and in *any* case it is of advantage. This addition to the resources of the printer is one of those admittedly-useful plans which, tried and approved of when first introduced, are yet allowed to fall into desuetude unless the work of assistants is well supervised. We know of many who used it and praised it when first fully described and its merits shown in our pages, yet we have a shrewd suspicion that its use has been dropped in more cases than one.

When the prints are ready for toning more expedition than usual should be displayed in the washing both before and after the process, as the yellow tone gradually taken by the whites does not entirely disappear in the hypo. if too long a time elapse after the first moistening of the prints before fixing. This washing should be done by placing the prints one by one in changes of water, rather than by the common method of turning on the tap on a number of them in a dish.

We alluded to the dark room when we commenced writing. We would further lay stress upon the necessity for ventilation. There ought to be in every dark room one large window or shutter capable of being quickly opened, so as to change the atmosphere in a short space of time when vitiated with the fumes of the various chemicals; and, no matter how pressing the work, this should be periodically insisted upon unless the ordinary ventilation is on an unusually excellent system.

In the studio much can be done to keep down the heat by the exercise of a little foresight and thoughtfulness. As a rule, the oppressive heat of such rooms is brought about, not by the high temperature of the external atmosphere, but by reason of the *direct rays of the sun finding an entrance into the studio,* combined with an absence of ventilation. We have been in well-known studios and noticed in the occasional moments, which will occur in the busiest of studios, when no sitter has been in the place, that no efforts whatever were made to keep out the sun. Strong, thick blinds were there, but they were drawn back, and the atmosphere, which might have been fairly pleasant, was almost insupportable. We know of more studios than one where the erection of a properly-constructed and suitably-placed wood screen outside would increase the comfort of the place to a considerable extent. The expenditure need not be by any means heavy.

We need not here dwell upon the usual means of keeping chemicals cool, and so forth; that has been done sufficiently often. Suffice it to say that cool chemicals and a cool studio will result in comfort to the operator and sitter, and also to greater chances of excellence in results.

IN A LION'S SKIN.

We regret to find in the ranks of photographers men whose moral feelings are blunted to such an extent as not only to prompt them to practice deception themselves upon the public, but also, measuring other persons by their own standard, to indulge in the hope that they will receive aid in such unworthy artifices.

We have long been aware that in the very lowest rank of the profession were to be found some who did not scruple to "annex" the choicest specimens of our best photographers and flaunt them before the world as their own work; but we had understood that such imposition had been confined to the *lowest* rank, and, moreover, had been discontinued. But we have now before us a letter of so recent a date as "June 22nd, 1877," which has been received by a photographic firm of considerable eminence, Messrs. Brown, Barnes, and Bell, of Liverpool, written by a Manchester photographer, to the following effect:—"Gentlemen,—I have rented a studio partly fitted. I have no specimens to show yet, and I have been advised by Mr. ———, of your town, to write to you to see if you could supply me with some.—Yours, respectfully," &c., &c.

We are indebted to Mr. Richard Brown, of the firm named, for forwarding this choice specimen of photographic mendacity. Mr. Brown, in the course of his letter, says:—

> "I commend the enclosed to your notice. We have frequent applications of a similar nature.
>
> "In Birmingham, the other day, I noticed that photographers boldly exhibit the best work of the best artists in their show-cases.
>
> "Surely the law is powerful enough to prevent such unscrupulous persons from so fraudulently *obtaining money under false pretences.*"

The opinion so clearly enunciated by Mr. Brown, that these are cases of fraudulently obtaining money under false pretences, is so much in harmony with our own feelings and, we are sure, with those of every true photographer jealous of the reputation of his craft, that we indulge in the hope of being enabled to hold up to public obloquy, through the means of our occasioanl articles headed "Photography in Court," the special cases where this species of dishonesty is brought home to the delinquent. We have abstained from giving "a local habitation and a name" to the wrongdoer in the present instance, but we shall not promise to be equally considerate for the future; for we are well aware of the asinine assumptions of the vendors of slip-slop and bad work, who make it their practice to be clad in the "lion's skin" of high-class specimens exhibited in their show-cases.

The increasing desire for pictures of a more artistic character than we have hitherto been satisfied with has created a very general demand for a simple and effective "cloud shutter" or sky-shade—a piece of apparatus which is certain to take a prominent part in the photography of the future. Various contrivances have been described in our columns and in our Almanac within the last few months; but, though simple and, at the same time, effective, very many amateurs appear unwilling to incur the small amount of trouble or expense involved in their adoption until they shall have been convinced, by ocular demonstration, of the value of the results to be secured. In order to enable our readers to test the utility of this adjunct to artistic photography with a very small expenditure of either labour or money, we are about to describe an extemporised arrangement which we can strongly recommend on the score not only of simplicity and economy, but also of efficiency. We may premise that, requiring such an appliance for immediate use and not having one ready to hand, we were compelled to "rig up" a temporary arrangement out of such materials as were within reach, and which are such as might be readily obtained even during a tour in the most remote parts of the country, while the construction is within the capacity of the merest novice in mechanics, occupies but a few minutes, and requires no more formidable tools than a pair of pliers, a bradawl, and a penknife. We shall describe the original, which with slight alterations may be transformed into a permanent instrument. It consists, first of all, of a piece of wood about three inches square and a quarter of an inch thick, in the centre of which a circular aperture is cut to fit the front of the lens in place of the cap. The lens which we were using is an old-fashioned one, with cell diaphragms; but with some forms a modification will be necessary, as the shutter will have to be fixed on to the body of the tube. Into one edge of this wood are inserted, at the extreme ends, two "eyes," formed by bending a short piece of wire round a stout knitting-needle or other cylindrical object of small diameter, and twisting the ends so as to form a shank by which they are fixed in the wood. The flap is formed by bending a piece of sheet-tin round a stout wire (an ordinary knitting-needle answers well) in such a manner that it fits sufficiently tight to revolve with the wire when the latter is "twirled" between the finger and thumb. This is easily done by pinching the wire tightly into the fold of the tin with a pair of pliers, when it will be found to hold sufficiently to move the with wire and still permit the latter to be withdrawn by the exercise of a little force. Draw out the wire, and, placing the flap between the two "eyes" previously mentioned, it is again inserted so as to form a hinge with the wood; the "eyes" are now bent forward a little in order to allow the flap to lie flat against one side of the wood. The pendulum is formed of a thin strip of wood about six inches long, split down the centre for about an inch of its length; the projecting end of the wire is inserted in the fork thus formed, and the wood is then bound round with two or three turns of thin twine, so as to clasp the wire tightly. A small screw is let into the lower end of the strip of wood, to which is hung a piece of twine carrying a weight sufficiently heavy to work the shutter, and the affair is complete. To use it: the wooden base is slipped on to the lens and the flap raised so as to clear the lens. This is done by grasping the pendulum rod with one hand, while with the other the flap is turned round on its axis; the weight of the pendulum will then keep it in position. Having focussed the view, lower the flap to the desired point and set the pendulum in motion; a few trials will show what degree of swing is necessary to produce the desired effect of "vignetting" the sky into the landscape, and by varying the length of the string it may be adjusted to a nicety. Very little motion is necessary, and with a weight of about half-a-pound the pendulum will continue its swing for a quarter of an hour or twenty minutes. The flap should, of course, be blackened on its under side. The only improvement we would suggest in a permanent instrument, beyond a little greater refinement in the details of construction, would be the addition of an arrangement upon the opposite end of the wire to the pendulum, by which the flap could be worked by hand when necessary. We do not offer this as anything new, but simply as a ready and economical means of trying the sky-shade before venturing upon a more elaborate instrument. It has the advantage of costing but a few pence, may be constructed easily in less than half-an-hour, and involves the possession of no mechanical skill.

NEW DEVELOPERS AND MODES OF DEVELOPMENT.

Part II.

3. Ferrous Salts *(continued)*.

At the conclusion of the first part of this paper I spoke of the remarkable developing properties of certain organic salts of ferrous oxide exhibited in developing a latent image in silver haloids in the entire absence of silver nitrate—a property either entirely, or almost entirely, wanting in ferrous sulphate. It is certain that this difference of action between ferrous sulphate and these organic salts is one of the most curious facts which I have met with in this investigation. A piece of sensitised and exposed paper, on which solution of ferrous sulphate produces no visible effect, flashes out with an image when immersed in a solution of ferrous oxalate or lactate of equal strength.

This power of development I have only so far verified with paper. There seem to be difficulties in the way of its application to collodion films which I have not yet been able to overcome. As to its action on gelatine I am as yet unable to speak. There seem to exist singular and, as yet, almost unsuspected differences in the action of different developers on different sorts of dry surfaces, all equally free from the presence of soluble silver salt. I take the opportunity of repeating what I said in the first part of this paper—that all the developments which I am describing were made upon paper. The action of these ferrous developers on negative paper development is very beautiful, clean, and satisfactory. Their usefulness for ordinary dry-plate work will require further study. It remains to say a few words on the preparation of ferrous oxalate.

Oxalic acid has a sufficiently strong affinity for ferrous oxide to displace sulphuric acid. When a solution of oxalic acid is poured into one of ferrous sulphate a bright yellow precipitate makes its appearance, forming slowly and continuing to increase for some time. The most convenient mode of employing ferrous oxalate, which is quite insoluble in water, is to dissolve it in a solution of neutral potassic oxalate, which takes it up with great facility, forming potassio-ferrous oxalate.* This substance I have obtained, by cooling a very concentrated solution, in small granular, reddish-yellow crystals, much deeper in colour than ferrous oxalate. For photographic use it is, however, by no means necessary to obtain it in the solid form, as the solution keeps very well.

This solution I have prepared in several different ways, but the best by much is that just referred to. Ferrous sulphate is to be dissolved in hot water. About half as much oxalic acid is also dissolved in hot water and added to the sulphate. At the end of a few hours precipitation is complete, and the precipitate may be washed by stirring up several times with renewed portions of cold water and decanting.

Some *neutral* potassic oxalate (which is easily obtained in commerce, or may be prepared by neutralising salt of sorrel with potassic carbonate) is dissolved in about three times its weight of boiling water, and the washed ferrous oxalate is dissolved in the hot solution as long as any is taken up. If the experiment has been properly performed this solution is perfectly neutral.

A much simpler though not quite so satisfactory a method consists in adding a solution of ferrous sulphate to a strong one of neutral potassic oxalate, until a permanent precipitate just begins to form. This liquid, filtered and diluted, possesses a marked developing power. The stronger and purer solution obtained in the first-described manner may be diluted before using with from five or ten up to thirty times its bulk of water. It is best when neutral, but a slight acid reaction does not prevent development, though it retards it. This mode of development cannot be correctly judged of except with oxalate prepared in the manner first above described.

4.—Development by Acids.

Various organic acids, supersaturated with potash so as to give an alkaline reaction, were tried upon a latent image with little result. *Cevadic acid* gave a tolerable development. As an exemplification of what I have said elsewhere—that the power of reducing silver haloids does not necessarily involve that of developing a latent image—it may be mentioned that, whilst *phenol, glyceric,* and *gentianic* acids show considerable reducing power, they are incapable of developing.

Oleic acid gave an image lighter than the ground. *Santonic, sinapic, gummic, malic, hippuric,* and other organic acids were either nearly or entirely without effect.

Vanadous acid—which was tried in the form of potassic vanadite, rendered alkaline by excess of potash—was without effect.

5.—Development by Resins.

Nearly allied to acids are the *resins,* which, for the most part, are capable of combining with alkalies. In the presence of excess of potash they generally exhibit a power of development much more marked than the more distinctly acid substances just referred to.

Amongst the resins *guaiacum* exhibits the best characterised developing properties. Dissolved in excess of weak aqueous potash it gives a bold and vigorous image, not far inferior to that produced by pyrogallol. *Balsam of tolu* and *colophony,* or ordinary resin, both exhibit with potash considerable developing power, but distinctly inferior to guiacum.

Resin of podophyllin was found to develope energetically.

6.—Development by Essential Oils.

The *essential oils* share with the resins the power of dissolving in aqueous solution of potash, and of forming liquids that often exhibit more or less developing power.

Amongst those which I tried *oil of cloves* appeared to be most active. Its solution in potash—of course much diluted with water—acts slowly on the image, which it brings out with regularity and without fog, so that it can be left for a considerable time in contact with the paper, during which the image steadily gains in vigour.

The green *oil of Roman chamomile* has properties somewhat similar to those of oil of cloves, but much weaker.

Oil of peppermint acts not unlike oleic acid. It seems to metallise the image, whilst it darkens those parts on which the light has not acted, thus producing a thin yellowish or golden image on a darker ground.

7.—Development by Bases.

A few organic bases were tried, but with so little result that it seemed not worth while to pursue the investigation further in that direction.

Codeia, when washed in solution over a dry plate as a "preservative," I found to considerably increase its sensitiveness; but when applied in conjunction with potash to a latent image it wholly failed to bring out anything.

Daturin gave a weak image.

8.—Development by Cuprous Oxide Dissolved in Ammonia.

The action of this solution was found to present a most interesting field for experiment. Its affinity for oxygen is of the most energetic character. Colourless when pure, it rapidly assumes a blue colour when exposed to the air. This action is so rapid that it can be watched by the eye; the blue colouration makes its appearance almost in the act of pouring the liquid out of the vial which contained it.

The ammoniacal solution of cuprous oxide is best obtained by putting a quantity of copper turnings into a vial furnished with a well-fitting glass stopper. Some cupric oxide, either hydrated or black, is next added, and the vial is then filled up with the strongest liquid ammonia. The addition of a small quantity of a copper salt expedites the action. For this purpose cupric sulphate (blue vitriol) may be employed, and added in the proportion of a drachm to every two or three ounces of ammonia. The vial is to be well shaken up at intervals for about a week, or till the liquid becomes quite colourless. It is then ready for use. The copper turnings have reduced the cupric oxide to cuprous oxide.

This solution, used in the proportion of about ten drops to the ounce of water, forms an active developer for sensitised and exposed paper. It is especially interesting as being, perhaps, the only entirely inorganic developer which will bring out a latent image in the entire absence of a soluble silver salt. Its activity, as might be expected, is materially increased by the presence of certain organic substances. The organic acids, as far as tried, exercise this power. They are best added in such quantity only as to leave a portion of the ammonia unsaturated and the solution alkaline in reaction.

Lactic and *formic* acids may be taken as the type of these organic acids. Both increase the power of the ammoniacal solution; of the two, formic acid acts the more energetically.

Quite a number of substances which develope the latent image when used in connection with potash act in a similar manner when combined with the cupro-ammoniacal solution. Amongst these may be mentioned *guiacum, gallo-tannic acid,* and *manna.*

When formic acid is used in conjunction with the cupro-ammoniacal solution, with, of course, the ammonia in excess, we may at the end of the development add a fresh portion of formic acid—enough to render the solution acid—and then some silver nitrate, and so set up a secondary development. I have obtained in this way an image of great vigour and power. This appears to be a property not recognised hitherto in formic acid, and suggests that it might be advantageously tried in other ways as a redeveloper.

The action of this cupro-ammoniacal solution is altogether different from that of ammonia taken alone, for the copper exercises a well-marked influence and vastly increases the power. Paper sensitised and exposed for such a time that it developes easily and quickly by the common alkaline development gives no image at all when tried with ammonia unmixed. When tried with the cupro-ammoniacal solution such paper easily and rapidly developes.

When organic substances are added, the colour of the resulting image is largely influenced by them. With formic acid a pure black was obtained, and nearly a black with guiacum. Manna, tannin, pyrogallol, and lactic acid each gave warm browns. Coffee, a peculiar and beautiful light sepia shade.

9.—Development by Various Other Substances.

Any vegetable substance that possesses reducing power (and the proportion of such is large) represents a *possible* developer. Consequently, if an organic "preservative" be applied and left in, this substance may, in certain cases, so react with potash as to cause development. For this reason sensitive surfaces may sometimes exhibit a faint development when treated with a solution containing nothing but potash. It is certain that this influence of the organic matter is sometimes not wholly removed even by long washing. Even after the most prolonged washing I have seen certain films develope a faint but perfectly visible image—strong enough to resist the fixing agent when simply treated with potash. In experiments on new developers it is necessary to bear this fact steadily in mind, else developing properties may be attributed to substances perfectly destitute of them. Ammonia has much less tendency to do this than potash; and, generally speaking, there are many substances which will develope under the influence of potash that will not do so with ammonia.

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* The investigations of Souchay and Lenssen show that potassio-ferrous oxalate contains one equivalent of potassic oxalate united to one of ferrous oxalate, precipitable by alcohol from the aqueous solution in combination with two equivalents of water.

The following are the reactions of various vegetable substances. In testing their action, their decoction was boiled for a few moments with very dilute potash, and then applied largely diluted to the sensitised and exposed paper:—

Areca nuts, aloes, the bark of the *berberin tree, morus tinctoria,* and the leaves of the *uva ursi* all exhibited considerable developing power.

Gratiola officinalis, ipecacuanha, pimento nuts—less power than the foregoing, but still well marked.

The following exhibited little or no action:—*Litmus, carthamus, rutin, bryony, stavesacre, colchicum, turmeric, nux vomica, caffein,* and *berberin.*

Acetone, warmed in a test tube with a few drops of dilute potash, and then diluted ten- or twenty-fold with water, rapidly brings out a bold and vigorous image of a peculiar purplish shade. The action is sufficiently strong to suggest possible future utility.

Aldehyde, on the other hand—from the character of which one would expect developing power—when applied in the same way as acetone gives no result.

10.—Appendix. Pyrogallol.

In the course of these examinations some observations on pyrogallol were made which seem worth mentioning. It is a familiar fact that pyrogallol has a certain developing power when applied alone, and that this power is greatly increased by the presence of a caustic or a carbonated alkali. Some years ago I found that *sodium sulphite* could replace the alkali—at first, I thought, with advantage; but careful comparative experiment showed that no such advantage existed, and I therefore (I believe) never published the observation, which had thus lost its interest and value. M. Sammann has lately obtained excellent results by substituting sodium hydrosulphite for the alkali.

I find that there exists quite a number of substances which can take the place of the alkali, and which, and with pyrogallol, give excellent results. *Sodium metaphosphate* gives a result about equal to that of an alkali, as also does potassium arsenite. *Sodium hypophosphite* gives a fair development, but inferior to the foregoing. These results, therefore, have no practical value.

On the other hand, a solution of *potassium formate* appears to give a more powerful development in conjunction with pyrogallol than any simple alkaline treatment. Without saying positively that this treatment deserves to take the place of the modes of development now in use, it would not surprise me if it should prove so.

To use this development a fifty-grain solution of potassium formate may be prepared and be used in any proportion from two or three minims up to thirty or forty to the ounce of the developer, with five or ten minims of a sixty-grain solution of pyrogallol. In some cases a much larger proportion of formate may be used when energetic treatment is desired. In my hands bromide has not been necessary; but this will, in all cases and in every development, depend upon the nature of the sensitive film, and its tendency to develope cleanly or otherwise. The image is bold and vigorous, and the development occupies not over half the ordinary time, supposing the exposure to have been the same.

Another remark which I have recently made, and which I believe is also new, is that I find that potash gives, with pyrogallol, a more powerful development than either ammonia or its carbonate. For this purpose a fifty-grain solution of caustic potash in water may be used, and a few drops be added to the developing solution. The quantity needed is but very small, and if too much were to be used on a dry plate it might be found to act injuriously on the collodion film.

In closing this long paper I must again say that, notwithstanding the large number of substances examined, the subject is far from exhausted. At a future time I propose to continue it myself. Any-one who may be curious to experiment in this field will doubtless be able to find organic substances which will act as developers when employed under the conditions here indicated—that is to say, in conjunction with fixed caustic alkali, potash, or soda, or with an ammoniacal solution of cuprous oxide. With ammonia or its carbonate a less energetic action will be obtained, or often none at all, even with substances which, used in connection with the first-named alkaline agents, give well-marked results. M. Carey Lea.

Philadelphia, June 11, 1877.

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BROMISED COLLODION PROCESS—DRY AND WET.

Dry or washed emulsion is at present the great theme of conversation with regard to photography. It is an emulsion containing only pure bromide of silver and pyroxyline. During my various experiments I have adopted several methods of preparing this substance, the preparation of which necessarily takes time and care.

I obtained good results with tolerable rapidity by the following process, which is not very difficult although somewhat costly. To those, however, to whom expense is no object it will be very useful on account of the excellence of the results. The *modus operandi* is as follows:—

Coat a plate of glass with bromised collodion prepared according to the formula to be presently stated, and sensitise in a silver bath (two per cent.), which should be acidulated, after which it must be washed in several changes of water, and placed in a solution of—

Water	1 ounce,
Chloride of zinc	3 grains,

and then washed with care. Detach the collodion from the glass with a large brush with the hair flattened like the tail of a fish, and put the pellicle in a glass containing distilled water. When a quantity of this substance is to be prepared it is carefully washed and placed to dry. All these operations must, of course, be conducted in non-actinic light. The washing removes all the soluble and deleterious salts, and leaves only bromide of silver mixed with pyroxyline. In order to make the emulsion it is only necessary to dissolve the bromide of pyroxyline in—

Ether	1 ounce, 6 drachms.
Alcohol	1 „ 4 „
Morphia, cinchonine, or quinine	4 grains.
Dry emulsion	46 „

In a few hours filter through cotton and the sensitive emulsion is ready for use, and will keep a considerable time. To coat the glass with this emulsion is not very difficult. It is then dried. If it be desired to use these plates wet it is only necessary that they should be immersed in water previous to being put in the dark slide. In order to develope pour a little alcohol on the film, and, after washing, apply the alkaline developer.

The bromide emulsion process now occupies a most important position in photography, when used either wet or dry. The process now to be described is very rapid and certain in its results, especially if an alkaline developer be used; it is especially well adapted for landscapes containing trees. This collodion will also keep for a very long time, as it does not deteriorate by age.

I give the three formulæ which, in my hands, have given the greatest satisfaction:—

1.

Ether	2 ounces, 1 drachm.
Alcohol	1 ounce, 4 drachms.
Pyroxyline in powder	20 grains.
Bromide of zinc or ammonium	20 „
Bromide of uranium	20 „
Chloride of barium	2 „
Alcoholic tincture of bromine	a few drops.

The salts must be dissolved in alcohol, and filtered; then add the pyroxyline previously dissolved in ether, and shake well. Having poured on a few drops of alcoholic solution leave it for a short time, after which filter.

2.

Ether	2 ounces, 1 drachm.
Alcohol	1 ounce, 4 drachms.
Pyroxyline in powder	20 grains.
Double bromide of cadmium and ammonium	40 „
Alcoholic tincture of bromine	a few drops.

3.

Ether	2 ounces, 1 drachm.
Alcohol	1 ounce, 4 drachms.
Pyroxyline in powder	20 grains.
Bromide of cadmium	30 „
Bromide of ammonium	10 „
Tincture of bromine	a few drops.

It is desirable to give the plates a substratum of a solution of india-rubber previous to coating them with collodion. When the collodion is set, immerse, without delay, in the following:—

Water	3½ ounces.
Nitrate of silver	4 drachms.
„ uranium	8 grains.

In about five or six minutes the plate will be fully sensitised; it should then be washed. Then pour over it a solution of—

Chloride of barium	3 grains,
Water	1 ounce,

or, better still, immerse in a bath containing this solution, after which give a final wash in order to take away all traces of soluble chloride. If the plate be coated with albumen its sensitiveness is slightly diminished.

If the plates are to be used dry, and within a few days after they are prepared, and it is required to have them in the most sensitive condition, they may be coated with a solution of—

Water	3½ ounces.
Acetate of morphia	8 grains.
Acetic acid	3 to 5 drops.
Pyrogallic acid	2 grains.

As a solution of morphia will not keep any length of time when mixed with pyrogallic acid, the following is recommended:—Prepare a solution of morphia with acetic acid, which will keep a long time; then, when about to be used, in the necessary quantity add one or two drops of pyrogallic acid in alcohol (ten per cent). Generally it is the smallest quantity that produces the best results.

The exposure is very rapid. In general a few seconds will suffice when the light is good.

In order to develope the following is used:—

Water	3½ ounces,
Pyrogallic acid	16 grains,
Bromide of ammonium	16 „
Liquid ammonia	10 drops,

which is poured on the film, and in a few seconds the image will appear; when the details have come out sufficiently the further manipulations are of the ordinary kind. ERNEST BOIVIN.

—Le Moniteur de la Photographie.

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OYSTER-SHELL MARKINGS AND DEVELOPMENT.

THOSE only who make it their business to try, know how difficult it is to get much practical information from professional photographers. It is not that they have little to give, neither does it, as a rule, arise from any unwillingness on their part to communicate what they know, but is rather to be attributed to that familiarity which is said to "breed contempt" both with what they have learned from others and what they have worked out for themselves. I do not, of course, mean that this familiarity, arising from the constant daily use of the particular formulæ and *modus operandi* by which their pictures are produced, lessens the value of either in their estimation, but rather that they get into the habit of thinking that what seems so simple and is so well known to themselves must be equally well known to others; that, in fact, the usual stereotyped reply—"Oh! I really have nothing to tell, as I just continue to work on in the good old way," is strictly accurate, while, in probably nine cases out of ten, no two operators could work half-an-hour together without each learning some little dodge or wrinkle from the other. Probably the secretaries of photographic societies know more than any other class about this backwardness of professional photographers in giving the benefit of their experience to their brethren generally, and yet it must be abundantly evident that whenever the reticence has been over much useful information has been obtained.

We have a good example of this in the modest paper read by Mr. Low before a recent meeting of the Edinburgh Photographic Society, where, in the space of little more than a column and a-half, at least half-a-dozen "things worth knowing" are pressed on our attention. No doubt many or all of those were known and practised by hundreds long ago; but it is equally certain that there are many more hundreds who did not know them, or if they ever did, had passed them into the limbo of facts not worth remembering. The acknowledged high-class work produced by Mr. Low gives an interest to anything that he may have to say concerning its production. But, apart from that, most of his recommendations are sufficiently self-evident to make us suppose that their use would be universal; and yet from the complaints that are frequently made, and the nature of much of the advice so often asked, it is clear that they are, largely at least, ignored.

Why, for example, do we hear so much during the hot season of "oyster-shell" and similar markings? Simply because the plates are not allowed a sufficient time to drain. Photographers—especially those who like to use wet collodion for landscape work—should know that if a plate be kept in an unchanged atmosphere it will remain sufficiently moist for several hours. During one of the warm days a fortnight ago I saw four 11 × 9 plates, after being allowed to drain over the bath for a couple of minutes, placed in an ordinary plate-box with blotting-paper at the bottom and a damp sponge between the glass and the wood. After a drive of six miles, and the selection of suitable points of view, three were exposed, and then an hour and a-half was spent at luncheon while waiting for a desired shadow before exposing the fourth. After the return drive, occupying in all a little over four hours, the plates were developed as easily as if just out of the bath, and quite free from markings of any kind; and, so far as I could see, there would have been no difference if they had been kept in the box for a much longer time.

In the development I noticed a good "dodge" which may be useful in cases where the plates have been too long kept. It is not new, but is none the less valuable on that account. The developer was of such a strength that one part added to three of water made a suitable solution. About six drachms of water and a little simple syrup—pure sugar dissolved in water—were placed in the developing glass, and poured repeatedly on and off the plate till it ran quite smoothly across the surface. To this were added two drachms of the concentrated developer, and on application the image immediately made its appearance, the development proceeding gradually and satisfactorily until sufficient density was attained, without necessity for any other means of intensification.

An examination of the specimens exhibited at the doors of, I am almost inclined to say, a majority of our portraitists will convince the observer that another of the recommendations made by Mr. Low is not much practised—"Put as little [of the developer] on the plate as you can, and do not rock it about." If this were generally attended to there would be little need for intensification, which, as too frequently carried on, results in the destruction of all texture, and deprives the negative of the delicate half-lights on which its principal charm so much depends. Nor are Mr. Low's observations concerning the bath of less value. It is no doubt a good thing to know how to doctor a sickly bath, as circumstances may occur in which the knowledge may be of use; but, as a general rule, now that everybody knows, or may easily get to know, where to obtain full value for chloride of silver, doctoring should give place to reduction, the difference between the price realised from the old and the cost of making the new being well spent in the saving of time and amply repaid in the production of better work.

Keeping these facts in mind, then, let us hope that in future many more of our professional brethren will be induced to believe that, after all, simple and patent as they think their modes of working to be, there may be something in them worth writing about.

JOHN NICOL, Ph.D.

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PHOTOGRAPHY IN THE EAST.—NOTES FROM CEYLON.*

As carbon printing seems, from the journals, to be the engrossing topic of the day, I do not think I can do better than commence these notes with a description of carbon printing in Ceylon.

Within a week of landing in this place I tried my hand at the production of carbon transparencies. In the evening I sensitised sufficient tissue to print twelve cabinet transparencies, and the first I developed yielded a splendid picture; but this one and another were all I got out of the batch. However, I set my wits to work and soon found out where the hitch was, with the result that my next batch was all right.

I then essayed some 18 × 15 enlargements, previous to which, however, I dissected the enlarging camera that had been placed at my disposal and dispensed with about twenty pounds' weight of rackwork, condensers, &c., and substituted a piece of ground glass instead. *En passant*, I may mention for the special benefit of the sceptical that the wooden swing bath which I brought out with me, and which is lined with black varnish, has had one gallon of solution in it for a month, and the said solution is in as good condition at the present time as on the first day.

After securing the enlarged negatives my next step was to get prints in carbon by single transfer, but here I met with a tremendous check. All went on well apparently until the development, when the print came away from the transfer paper, the tissue, in fact, being perfectly insoluble. I had to set to work and find out where the hitch was. After a great deal of trouble and worry I discovered it; and now, even at the hottest time of the year in Ceylon, I can set to work and turn out carbon prints with ease and certainty. After the rainy season I expect I shall be able to work it with still greater ease, although there are more precautions to observe and care to exercise than in England.

When in England many of my friends who produced their own carbon transparencies were continually grumbling at the Autotype Company for sending out transparency tissue in which lumps of grit and unground pigment were alleged to have been very prominent. I, not knowing their method of working, could only wonder at the effect and disclaim any idea of the tissue being bad; but now I can emphatically assert that the transparency tissue of the Autotype Company sold to customers is quite as free from grit and badly-ground pigment as that used in the Autotype Works. The reason why I can say this is as follows:—Some of my earlier batches were full of spots and specks, like those of my friends in England; so when preparing the next batch, I very carefully filtered every solution, even the cold water used to damp the tissue previous to mounting it on the developing support, and the consequence was the transparencies were quite free from grit and specks of any description.

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* This communication was in type last week, but was unavoidably left over in consequence of pressure on our space.—EDS.

In concluding my remarks on carbon printing let me give a word of advice to beginners. If, in the earlier stages of learning, failure ensue do not blame the tissue and throw up the process in disgust, but blame yourself and go carefully through the manipulations and see where you have erred; for I can assert from personal knowledge and practical experience that the tissue sold by the Autotype Company is as near perfection as it is possible with such a substance as gelatine.

Now that I am writing, perhaps it will be of interest to your readers to have some description of photography in Ceylon. Well, except that the thermometer stands at between 85° and 90°, there is not much difference between here and England. The collodion I use (and splendidly it works, too) is Huggon's; the bath is thirty grains' strong; and the exposure a little longer than in England, on account of the contrasts being much greater. The coolies that accompany me are steady, and one who has been accustomed to photography for about ten years is really useful—gets the tent packed from the dark room, and at the other end unpacks and gets everything ready for me; so that at the commencement of my work all is done so quickly and neatly as to make outdoor work a pleasure instead of a bore as it is at home, where you must do everything yourself or run the risk of having something broken or left behind.

One day when stock-taking I came across a lot of old watch-cases and proposed to convert them into nitrate of silver, which was speedily done by dissolving in nitric acid. When all was dissolved I evaporated to dryness, and fused, then dissolved the residue in water until the argentometer showed thirty-five grains, and after filtering I had a solution of a pea-green colour, but which, nevertheless, gives excellent negatives; so I shall not go to the trouble of taking out the iron and copper, as they evidently are not pernicious in their action.

In The British Journal of Photography for March 30th Mr. A. L. Henderson gives a formula for a developer the principle of which is what I have been trying to get at for many years, viz., perfect compatibility between bath and developer. When I saw Mr. Henderson's formula I tried it at once and am very pleased indeed at the result, so also are three other photographers to whom I have given the formula.

As some of your readers may possibly have overlooked it (although they have doubtless seen it), as it was tacked on to a letter on other matters, I will, with your permission, give the formula again:—

Protosulphate of iron	2 drachms.
Common alum	4 ,,
Acetic acid	2 ,,
Gum camphor (broken up into small pieces in the bottle)............................	in excess.
Water	6 ounces.

This developer, when tested by the argentometer, will register about thirty grains. Should a stronger or a weaker solution be used the alum should be increased or decreased in the same ratio.

When on my voyage out here I called upon a photographer at Aden, and was much astonished at seeing a bottle of distilled water that had been sent from England for the special purpose of making baths. I got him to let me show him how to make a bath by dissolving half-an-ounce of nitrate of silver in eighty ounces of water, to which I added cyanide of potassium until a permanent precipitate was formed. This I told him to put into the sun, next day filter, and add the remainder of the nitrate of silver and about ten grains of nitrate of baryta. As I left Aden the same evening I could not see the result, but the other day I had a letter from the Aden photographer saying the result was so excellent that for the future no more water would be required from England. This I mention merely to show that the use of cyanide of potassium and nitrate of baryta are perfectly successful even in the hands of a novice.

W. T. Wilkinson.

Ceylon.

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ON THINGS IN GENERAL.

If a foreigner, ignorant of the British nation and its peculiarities, were to take up a few back numbers of The British Journal of Photography, and endeavour to obtain from them an idea of my countrymen, he would say—"The British people are mainly employed in making oxygen and squabbling over the proper method of doing it." When will this wretched oxygen controversy cease, I wonder? The best thing that could happen would be for each one of the combatants to mix about an ounce of gum with a pound of oxygen mixture, and be shut up in a small laboratory till the gas was all evolved. The one who came out of the ordeal with fewest limbs broken should be adjudged the discoverer and original inventor.

Strangely enough, these disputants have brought into the widening circle the name of a gentleman whose son nearly lost his life many years ago by an explosion brought about in making oxygen gas. It may readily be believed that any improvement which possesses the weight of his recommendation must be good. But, apart from reasons of this nature, Mr. Dale's dicta may be accepted with confidence; for he is a clever and original experimentalist, and I am proud of having had the honour of being introduced to him on an occasion when he courteously showed me some most interesting mementoes of the early stage of the collodion process. As far as I remember his conversation, he took one of the first photographs in the north of England, his only instructions being a small newspaper paragraph. In those days, of course, he could not go into a photographic shop and buy what he wanted in the shape of the necessary chemicals. He, for the purposes of trying this new process, made his own nitrate of silver, gun-cotton, and, indeed, almost every chemical needed, and succeeded in producing very excellent pictures, which he still possesses, or did when I saw him, for he looks upon them with a just pride.

I should very much like to hear Mr. Dale's opinion upon the latest manipulative heterodoxy sent forth. We have all heard of the addition of cyanide to a bath to improve its working qualities, and, having got over the first shudder which the idea caused, many of us have tried and succeeded with it; but who has ever thought, except with horror, of putting hypo. in his bath?—the very substance before all others that we have been taught ever since we knew what a photograph was to keep rigidly excluded from the bath on pain of instant ruin to that fickle solution. But now an American gentleman has boldly recommended us, of malice aforethought, to pop into the bath a small crystal of hypo. The results, he announces, will be most satisfactory; in his own case it produced the best bath he ever had. Certainly, there might be more opinions than one as to the advisability of listening to a man whose chemical training did not stand in the way of his using dirty scales for weighing silver. However, here are his instructions:—Five ounces of silver, five grains of hypo., and sixty ounces of water. If acid should be needed, one drop at a time (of the pure strong acid) is to be added. Note, however, the advice contained in his deliciously naïve conclusion: "more soda might be better; let some one try."

Second-hand quotations from Ruskin form the literary stock-in-trade of a great many would-be fine-art writers. A photographer at the American Convention has been giving some of his opinions upon art, composed of the stock ideas and trite phrases we are so familiar with, and enlivened by a little Ruskin. His knowledge of the writer was so evidently coached-up that he even could not refer to any particular work of the "great writer," and contented himself by mentioning a volume of choice extracts, page so and so! This, I think, is about the most detestable style of literary composition possible. If a man has anything new in his brains he can generally put it into words, and sometimes does so with advantage to his fellows; but surely the day is over now for making a crib from Ruskin or Sir Joshua Reynolds' lectures, and tagging the extracts with a lot of inane rubbish supposed to be original. The man who quotes in this fashion is as much a social bore as the one who quotes poetry, and is as much to be shunned.

Not least among the interesting gleanings from the photographic section is the reply made by a Mr. Brown to a query as to the best method of keeping a plate moist during long exposures. Mr. Brown had often tried to do this, and succeeded by "placing the plate on a perfectly-level table with the face down." How the exposure was to be carried on at the time he did not state, and it is difficult to understand; "but they manage those things better" in America. We are further to learn from him that a plate flowed with glycerine and water will keep good for a week, and be as sensitive as a fresh plate.

However, the best of photographers and the cleverest of men may be caught tripping. There are two writers in this Journal whom I have a great respect for—the "Peripatetic Photographer" and Dr. Nicol; but I am going to try a tilt at each. The "Peripatetic Photographer" says he cannot agree with the Editors that the difficulty of producing vignetted prints in carbon has always been acknowledged. He had better go to the Editors at once and make it up; for among the best carbon workers I think he will find this vignetting admitted to be a very troublesome affair. Vignettes take with the public; yet I do not think M. Lambert did much that way, with all his skill, and I am very certain that if he will take a score of old carbon *employés* they will tell him of the difficulties. Of course for clever men like him and me it is no trouble, but then we are exceptional. What does he mean by saying—"Provided the safe-edge precaution be not lost sight of?" What use is the safe-edge in the production of a vignette?

Now, Dr. Nicol. This gentleman finds that, when using a *carte* lens by a first-rate maker for taking a negative on 7¼ × 7½ plates, it was so far from covering it that an over-exposed picture ended in clear glass long before it reached the edges of the glass. I don't think any lens I know of that is made for *carte-de-visite* work would cover (I don't say define well) less than a five-inch circle, and that would scarcely coincide with the learned Doctor's description. *Du reste!* I always read his articles with a deal of pleasure.

It is very dreadful to read of our art having its "fashions for the season," as we read of in the *Practical Photographer*. What next, I should like to know? Will the photographers follow suit, and circularise their neighbourhood?—"Mr. Sienna respectfully announces that on the first of the month he will will show his fashions for the summer season. He has just returned from a trip to America, and brought with him a large assortment of the latest novelties in furniture and backgrounds, a trial of which he respectfully solicits. All orders promptly executed." The thought is too painful to dwell upon!

I hasten from it, and rush next to France, to see what can be learnt there, and at last my eyes are gratified by particulars of a new instantaneous process to be found in the journal of the French Society. To make the collodion we are directed to cork some pyroxyline up for a month, when it will begin to decompose. What wretched pyroxyline they must have across there! We are next directed to dissolve this decomposed cotton so as to obtain aldehyde. Bromine is then put in the mixture, with the result of a big fizz, like putting a hot iron into water; and, finally the accelerating solution—a mess made with iodide of cadmium, ammonia, alcohol, nitrate of ammonia, and glacial acetic acid!! I am sure no one can bend his mind to any other serious work after reading this, and I will leave my readers with a parting advice—a repetition of Mr. Munger's words with regard to the hypo. in the bath—"Let some one try." FREE LANCE.

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NOTES FROM THE NORTH.

A CORRESPONDENT in a recent number of THE BRITISH JOURNAL OF PHOTOGRAPHY seeks some information concerning dextrine which has not as yet been given. I have used it for many years, and find it a really "handy household thing," quite equal to starch as a mountant and much less troublesome. Dextrine, being soluble in hot water, may be converted into a suitable paste by simply pouring the latter on the former, stirring the while, just as a Scotchman makes his *brose;* but in this way considerable difficulty is found in breaking up the lumps or *knots* formed. Commercial dextrine varies in colour from almost white to a dark straw or lightish brown, and the variation in strength of different samples is quite as great, so that no definite formula can be given for the production of an uniform paste. It is, therefore, better to lay in a good supply, and, having ascertained the proportions that give the proper syrupy consistence, stick to them so long as it lasts.

One pound of that I have at present on hand requires one part (twenty ounces) of water, but I have had samples that stood thirty ounces, and others that were not too thick with only fifteen ounces. The dextrine should be placed in a Berlin porcelain basin or other round-bottomed vessel that will stand the fire, an ordinary saucepan with a flat bottom being apt to burn the portions that lodge in the corners in spite of careful stirring. The proper quantity of cold water is then added at once, and the whole stirred till an uniform mass is obtained. Heat should then be applied with constant stirring till the solution begins to boil, and the stirring continued till the paste so formed is cold enough to prevent the formation of a skin. When quite cold a few drops of carbolic acid should be added, and the operation is completed. Dextrine paste thus prepared is very adhesive, easily applied as a photographic mountant, or for any purpose for which paste is required, and will keep good for any length of time.

Notices are already posted in most of the Edinburgh photographic establishments intimating that they will be closed on the 12th proximo (the time fixed for the annual holiday), and arrangements are nearly completed for the excursion to Almond Dell. It is really matter for surprise that the example set by the Edinburgh Photographic Society in instituting and carrying out this annual gathering, which affords so much pleasure to both employer and employed, and does so much to "round off" the angularities incident to professional competition, has not been more generally followed in other localities.

A number of years ago the Editors published an illustrated description of Bunsen's air-pump or aspirator, from which a handy plumber fitted up one in my laboratory. He is dead now—more's the pity! as he was so pleased with its working that he would not charge anything for it. I have used it ever since for filtering, evaporating, drying, and many other purposes. In addition to its cost, for those who had to pay for it, the fall of twenty feet or so required for its successful operation tended much to limit its adoption by those to whom it would have been of much use; but I have recently had an opportunity of examining a substitute for it which requires no fall at all, does its work most admirably, and costs only a few shillings. Messrs. Mawson and Swan, of Newcastle-on-Tyne, to whom photographers already owe so much, are the introducers of this improved article, and it is to one of their representatives who has just favoured me with a call that I am indebted for the opportunity of examining it.

It is called the "water-jet aspirator," and consists of a glass tube of about eight inches in length and three-quarters of an inch in diameter in the centre, and slightly contracted at both ends. Inside the wide portion of the tube is fixed a glass arrangement similar to what would result from the union of two of the small funnels used in certain chemical apparatus—one known as the "thistle" form, the other as the ordinary cone shape. Springing from the centre of this thick part of the tube, and at right angles to it, is a short tube of much smaller diameter, giving the aspirator the appearance of a T piece with the upright much shorter than the cross head. To set the apparatus in working order all that is necessary is to attach one of the long ends by a rubber tube to the ordinary supply pipe—under full pressure, if possible, but from the cistern will do—and by a tube at the other end conduct the water into a sink or any convenient vessel. As soon as the water begins to flow air is rapidly drawn in through the short side tube, and with such force that any vessel connected therewith will soon become exhausted to an extent equal to a column of mercury of nearly full barometric height. In other words, the full power of an ordinary air-pump may at once be obtained with no more labour than the turning of a tap, and with the expenditure of very little water, or indeed none at all, if the water be returned to the cistern.

With such a piece of apparatus, occupying so little room and so easily brought into play, the filtering of collodion, or even much more glutenous liquids, such as emulsions, may be accomplished as rapidly as simple water. Altogether its uses are so obvious that I feel sure both photographers and chemists will thank Messrs. Mawson and Swan for bringing it within their reach.

There are many, both at home and abroad, who will hear with deep regret of the death of Mrs. Tunny, of Edinburgh, which occurred on the 25th inst. She was a "helpmeet" to Mr. Tunny in the true sense of the term, an enthusiastic lover of the art, and one of the most artistic photographers that ever laid paper on a negative. Mrs. Tunny possessed a refined and cultivated taste, and a thorough knowledge of the requirements of photography—a lasting memorial of which may be seen in the recently-erected establishment in Maitland-street, which is one of the most elegant and perfect in the country, and which we hope we are committing no breach of confidence in saying was principally the work of the deceased lady. Mrs. Tunny, while ever diligent in business, displayed at all times an open-handed friendship, and gave a hearty welcome to all connected with the art. She never seemed so happy as when exercising a genuine hospitality to the numerous strangers who came "within her gates." JOHN NICOL, Ph.D.

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Meetings of Societies.

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EDINBURGH PHOTOGRAPHIC SOCIETY.

AN outdoor meeting of this Society—the third of the season—was held at Arniston, on Thursday, the 21st inst. The place of rendezvous, the mound, was left at 9.25, but by a misunderstanding on the part of the driver the party was driven to near *Orimston*, and the place of destination was not reached till considerably after midday. This, however, as as it turned out, was not matter for regret, as the drive through a district altogether new to those present was very beautiful and much enjoyed.

On arriving at Arniston a halt was made and luncheon served under the well-known beech avenue, the overhanging branches of which form a roof so close that, although a heavy thunder shower fell during the time, not a drop reached the party. By-and-by the sun again came out, and the members separated and commenced the work of the day; but, so far as we have been able to learn, not with much success, as the light was very poor.

Arniston—or rather that part of it most interesting from a photographic point of view—is a narrow glen about three-quarters of a mile in length, with a pretty stream winding tortuously from end to end, crossed here and there by quaint rustic bridges. The banks are well wooded and completely filled with ferns, rhododendrons, &c., and at the present time show in great profusion almost every wild flower indigenous to the country.

In the course of the afternoon the members were called together, and on the President taking the "chair"—a huge boulder by the side of the stream—several items of business were transacted, and Messrs. William Bertram, James Bertram, Harry Macbeth, John Gibb, Adam Duncan, and John Heron were admitted ordinary members. Altogether the party was a happy one, and the excursion was thoroughly enjoyed.

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BERLIN PHOTOGRAPHIC SOCIETY.

A MEETING of this Society was held on the 4th May,—Dr. Vogel in the chair.

Two photographs of an electric spark, taken by Herr Hornung, of Tübingen, were shown. The image of one of the sparks was very vivid; it stretched the whole length of a *carte de visite*, forming an irregular white line equal in power to that of a ray of lightning. The electricity was generated by a Holz machine, and the photographs of the sparks were taken at night with an exposure of about the millionth part of a second.

The President then read a humorous letter from Herr Kurtz, of New York, which excited great merriment.

A communication from Herr Tiator, of Colmar, was then read, in which he described a photographic travelling apparatus, weighing about fifteen kilogrammes before the water reservoir was filled or the chemicals added. Everything was packed into one parcel, and the apparatus consisted of—1. An expanding camera. 2. A plate-box, holding a dozen plates. 3. A water reservoir. 4. A glass bath, with a well-fitting lid. 5. Packing-room for the necessary bottles and utensils. 6. A box with compartments for chemicals. The apparatus is intended to be carried by a pedestrian, and the description was accompanied by directions for unpacking, setting up, and use. As yet Herr Tiator has only executed a model of his apparatus, and he wished for the opinion of the meeting as to whether it would be worth his while to have one constructed in wood and iron.

A discussion followed, in the course of which various objections were made to the apparatus, one being that if it weighed fifteen kilogrammes when empty, after the liquids, &c., were added it would be too heavy for one man to carry. Another objection was that the operator would have to work by means of arm-holes, as in Davis's tent-camera, and could not see very well what he was doing.

The President showed a new Voigtländer lens which has lately been placed in the market in seven different sizes, and called "euryscopes." He (Dr. Vogel) and Herr Prümm then gave an account of certain experiments made when comparing these new lenses with those of other makers, with the result of finding the new comers fully as powerful as their predecessors.

Herr GRÜNBERGER reported on his experiments with an alcoholic sensitising bath for carbon prints, and showed prints, some of which had been sensitised with bichromate of ammonia in an alcoholic solution, and others with bichromate of potassium in an alcoholic solution. The first were monotonous and perfectly useless; the others did not appear to differ in any way from ordinary carbon prints.

Herr REICHARD said he had also been experimenting with an alcoholic bichromate bath. He had dissolved four grammes of potassic bichromate in seventy grammes of water, and then carefully added thirty grammes of alcohol. (If the water and the alcohol were previously mixed, he found that the above-mentioned quantity of the bichromate would only be partially dissolved.) The paper took on the solution very easily, dried quickly, and was then much more flexible than paper sensitised in the ordinary way.

The PRESIDENT explained the favourable action of the alcohol in the bichromate bath to be caused by its acting less as a solvent upon glycerine and gelatine than water, so that the paper remained more flexible, and the carbon film had less tendency to run off.

Herr REICHARD recommended that the tissues should be coated with collodion before the application of the squeegee and the developing, as the pictures could then be developed with much greater certainty, and could better withstand rubbing than those developed in the ordinary way.

Herr SCHAARWÄCHTER remarked that he had also tried the collodionising of the sheets of carbon tissue, and found it quite prevented the formation of the granular structure complained of. The collodion must, however, be very thin—scarcely one per cent.—otherwise it was apt to spring off.

Herr REICHARD thought that even with a stronger collodion the picture might be prevented from springing off the glass by a coating of a one-to-ten solution of gum or a one-to-fifteen solution of dextrine.

Herr GRÜNBERGER then showed a carbon picture which had been produced by a seven minutes' exposure in a printing-frame to electric light. The light was generated by a Siemens' electro-magnetic battery set in motion by a four-horse power steam-engine. The distance of the light from the printing-frame was twenty-two centimetres.

The PRESIDENT had made some photometric experiments as to the strength of this light. He had allowed it to act for seven minutes upon his photometer at a distance of twenty-two centimetres, and found that its action reached the fifteenth degree of the photometer; or, in other words, that its action was equal to that of the burning of 1·5 gramme of magnesium wire.

Herr GRÜNBERGER then referred to his former recommendation that albumenised paper having a tendency to blister should be laid in salt and water after fixing. He had again several times repeated his experiments, and had been able to prevent the formation of blisters in Herr Schaarwächter's blistery paper by placing the prints, after fixing, in a salt bath of one handful of kitchen salt to a litre of water.

Herr BOLL remarked that he toned his pictures in a gold bath, to which he added a large quantity of common salt.

A photo. crayon, by Herr Kurtz, of New York, having been passed round for examination and duly admired, the proceedings were brought to a close and the meeting was adjourned.

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VIENNA PHOTOGRAPHIC SOCIETY.

AN ordinary meeting of the above Society was held on the 17th April,—Dr. Hornig, President, occupied the chair.

The PRESIDENT showed three specimens of spun glass cotton and spoke of the advantages presented by glass cotton over asbestus, glass powder, or pyroxyline, for the filtration of easily-reduced substances, and thought it should find a place in the list of photographic requisites. He also distributed twenty-five samples of Elizabeth collodion.

Dr. J. M. EDER then discussed Herr von Stefanowski's recent paper on the toning of carbon prints. He scarcely thought that all the pretensions of the manufacturers and consumers of tissue would be found to be justified, and he had considerable doubts as to the claim to unchangeableness. He thought, especially, that toning with dye-stuffs of organic origin or those forming sulphurous compounds with iron, nickel, and cobalt, or blue cyanogen compounds, was not advisable, on account of the fugitiveness of the tints, for pictures intended to be permanent. With regard to the recommended toning with silver compounds, the speaker thought that, however worthy of recognition the idea might be, having in view a merely temporary effect, he did not think it suitable to introduce into carbon printing, whose fundamental principle was the production of permanent prints by using substances perfectly unaffected by atmospheric influences—a reagent with respect to whose stability grave doubts were entertained. He also pronounced, from a theoretical standpoint, against the intensification with lead compounds and with red prussiate of potash. Lastly, he remarked that, with respect to the removal of air-bubbles by boiled water, the low coefficient of absorption of the latter in conjunction with the superabundance of atmospheric air left but a very narrow margin for action upon the bubbles.

Herr VON STEFANOWSKI thanked Dr. Eder for his explanatory comments and corrections, from the theoretico-chemical point of view, of his treatment of the toning of carbon prints, and believed that discussions between the theorist and the practical man were always to be encouraged in the interests of truth. He hoped that, in the present instance, the discussion would serve the cause of progress in carbon photography. With regard to the special objections made by Dr. Eder, he (Herr Von Stefanowski) made several counter pleas. He was of opinion that, notwithstanding instability, intensification with chromate of silver and iron, cobaltic and nickel sulphides [see paragraphs 20, 27, 28, 31, in the article, pages 223 and 224 of THE BRITISH JOURNAL OF PHOTOGRAPHY, for May 11, and continuation in next number] would be extensively employed, especially for positives to be reversed, and for the multiplication of matrices. With regard to the instability of the organic colouring method: that was a question which must be left to time, and, in a year or so, on looking over the specimen prints sent them, that Society would be able to answer it favourably or unfavourably as the case might be. In the short time devoted to those experiments it was quite impossible for him to come to a decision as to the permanency of each separate tone, yet he so far agreed with Dr. Eder as to consider that organic colouring mediums—especially those into which aniline red enters, but less so those containing alizarine, purpurine, and coralline—seemed to be very fugitive. In his article he (Herr Von Stefanowski) recognised the instability of the aniline colours by only recommending aniline red for the intensification of carbon pictures when to be used for enlargements—that is, for immediate use. Should, however, other aniline dyes be used to obtain other tones for the carbon picture, then, perhaps, it would be better to have recourse to the original plan of fixing with potassic permanganate. He fully agreed with Dr. Eder's remark that carbon prints were best unintensified—that is, that they should be kept in the condition in which they were developed—yet his reason for thinking so was quite different from Dr. Eder's. The view of that gentleman seemed to be that supplementary toning of the carbon print should be avoided, because one could not always produce the desired shade of the desired colour, and because the colour of the tissue was the most durable. To that he (Herr Von Stefanowski) replied that alizarine and purpurine were used in the manufacture of carbon tissue as well as the more durable colours, and that a supplementary colour was also admissible when the original colour of the tissue was an undesirable colour, and which not seldom contained carmine—a far from stable dye-stuff. The grounds upon which Dr. Eder based his objection to the toning or intensification of carbon prints were twofold:—1. The increase of the already too numerous manipulations. 2. The partial uncertainty as to the resulting tint. As far as the second point was concerned the same difference might be observed to be caused by the use of different sorts of paper, one of which might possibly contain alkaline and the other acid reagents. In the present case such reactions appeared of very little importance. He (Herr Von Stefanowski) admitted the superfluity of the ferrocyanide of potassium in paragraphs 16 and 17, from the theoretico-chemical point of view, but as a practical man he contested the point. Solutions of salts of lead acted upon the gelatinous film like alum, and the upper surface of the picture film was so hardened by it, and rendered horny, that several hours, or even days, were required before the lead solution could penetrate the whole film equally. Red prussiate of potassium (ferrocyanide of potassium) offered, in practice, the quickest means of saturation, and was, therefore, advantageously added to the colouring matter in Nos. 16 and 17. Lastly, with regard to the power of boiled water to absorb air, he had found it so great in practice, and, if his memory served him, in theory also, that carbon pictures attacked by air-bubbles during the development had been freed by it, so that, in the absence of any other means of removing bubbles, he felt that he might still recommend their absorption by boiled water.

Herr Max Jaffé showed some photolithographs, by Poitevin, produced in the year 1856, and sent by the Abbé Moigno, per Herr Lenoir. The interest of the pictures was that though they were twenty years old the half-tones had a delicacy scarcely surpassed by the lichtdruck pictures of today.

Several other objects—amongst others a Jaffétype—were then laid on the table. Poitevin's merits as a pioneer of photolithography were favourably discussed; then followed a prolonged discussion on enlargements, in which Herren Kramer and Luckhardt and Baron Schwarz-Senborn took part.

The President then laid eleven new publications on the table, making a few appropriate remarks on each. He also called attention to the programme of the permanent exhibition at Philadelphia, and shortly afterwards declared the meeting closed.

A meeting of the same Society was held on the 15th May, Dr. Hornig in the chair, at which most of the business transacted was of but little general interest.

The Chairman laid on the table the programme of the Anthropological Section of the Paris Exhibition of 1878, and invited contributions of pictures for it.

Herr K. Klic described experiments for the production of printing plates in half-tones for the printing press, and maintained that the results furnished by the help of various sorts of net were not satisfactory, inasmuch as they produced raised points, which offered a real hindrance to the etching and printing process. The speaker recommended that the texture be produced intead by two sets of parallel lines crossing each other, so as to give the effect of hatching.

The Chairman handed round for inspection a photograph of a new movable dark room, constructed by Herr Schiessel, and laid upon the table three new technical publications and two lamp glasses. These last were clylinders of orange-yellow glass, called by the makers, MM. Appert frères, "anti-photogenic glass." This glass is said to impede the chemical action of even actinic lights to such an extent that, when interposed between a candle, a lamp, or a gas flame and a very sensitive plate, upon which in about thirty minutes a very distinct action would be observable under a glass coloured with silver in the ordinary way, scarcely a trace of fog is to be seen after an equally long exposure. The same firm manufactures all sorts of photographic requisites, such as glass shades, baths, cups, and sheets of glass, of this same orange-coloured glass. He (the Chairman) then read an inquiry from a provincial member as to how he might best protect the roof of his glass house from being broken during hailstorms, or whether he could insure it.

One member thought the Plate Glass Insurance Company might insure his glass house. Another thought hardened glass might be used for the roof, and that it would be less easily broken by hail than common glass.

Baron Schwarz-Senborn remarked that in France, and especially in Paris, where hailstorms are frequent, glass roofs are generally protected by a sort of cheap straw matting.

Herr Jaffé thought the roofs of glass houses had scarcely a sufficient fall to let snow, hail, &c., slide easily off.

Herr Gertinger thought that if the roof had a greater fall in a portrait studio the light might be unfavourable.

The Chairman called attention to Herr Siemens' process for hardening glass.

The meeting was shortly afterwards adjourned.

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Correspondence.

EMULSION PHOTOGRAPHY.

To the Editors.

Gentlemen,—I should be much interested to hear whether the "Peripatetic Photographer" or anyone else has tried Captain Abney's formula for collodion emulsion, as the former stated that he would do so. Should he have had any experience with the emulsion I would be glad if he would state its character, and, secondly, the quantity and quality of the solvents used for its formation. From an experiment I have lately made I incline to believe that the solvents should be *pure*, if not rectified.

With this modification of M. Sammann's developer, which I gave in my communication to the Photographic Society of Great Britain, and with the emulsions I have prepared which transmit the orange rays, I now find no use in the tannin addition to the hypophosphite solution; indeed it appears advantageous to omit it, as the development is then much more rapid—as much so as that with the ordinary alkaline developer. At the same time, I believe it would be valuable with Captain Abney's own preparations.

In the seventh line of my paper, at page 297, for "quantity" *read* "quality"; and, of course, alter all the "ides," further down, into "*ites.*"

There is one little practical point which seems to throw some doubt on the theory that the latent image is formed necessarily of sub-bromide of silver. It is, that when we precipitate silver bromide by adding silver nitrate to a soluble bromide we do not suggest that sub-bromide of silver will be formed through the action of the diffused or artificial light in which the operation takes place; neither do we find it necessary to use more than the theoretical (or thereabouts) quantity of silver nitrate with a view to its combination with the bromine set free from the light-altered bromide.

I have no doubt that prolonged exposure to light produces a change —and a visible one too—by the liberation of bromine; but, why do we not find that the comparatively short impact of light effects a disturbance upon the reaction? Is the silver bromide not altered in any way by such exposure to light? I am not necessarily trying to lend support to the "physical theory," but rather to show a possible weakness in the "sub-bromide theory."—I am, yours, &c., H. B. Berkeley.

Cotheridge Court, Worcester, June 26, 1877.

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ON EXPRESSION.

To the Editors.

Gentlemen,—Trusting that the following may be of some assistance to your correspondent, E. Barry, with regard to his trouble in dealing with expression, and, moreover, his difficulties in understanding vague ideas or directions from a book he has read on retouching, I venture to make a few suggestions.

The best work that I know of that might be studied with advantage is *Essays on the Anatomy of Expression in Painting*, by Chas. Bell. It is rather an old book, published by Longman and Hurst in 1806. I have found it most invaluable in studying the varied expressions of the human face.

The greatest difficulty I have to contend with is when I see my sitter (who doubtless fancies himself bound to summon up all his courage for the dreaded few moments of exposure) assume a fixed seriousness on the face, which sometimes can be dispelled by a little good-humoured chaff.

I think good conversational powers indispensable in a successful operator, no matter who his subject may be in the studio. I generally tell my sitters to try and look as comfortable and natural as possible when I fancy they feel as if about to undergo a dreaded operation. When I see my subject knit his brows I ask him to raise them, but if he persists in frowning I have to retouch out those perpendicular lines on the brows and curve the eyebrows on the negative.

The next important feature is the mouth. It is as well always to notice how your sitter "holds his mouth." There are some kinds of mouths very difficult to manage, especially that kind vulgarly called the "fish mouth," which occurs when the top lip is so long that it prevents the lips from meeting in a natural manner. Subjects of this class frequently insist upon closing their lips, thereby producing the upward curvature of the lower lip suggestive of its title, which no amount of retouching, however cleverly applied, can transform into a handsome feature. Of course the lines on each side of the mouth could be shortened or softened. But the best plan is to take another negative with the lips apart, and compare results.

I would suggest, in addition to the work quoted above, your correspondent should study the beautiful productions, as regards expression in photographs, by the late O. G. Rejlander; also, the charming pictures of children's expression by Mr. R. Faulkner, and others.

Trusting that these suggestions may in some small way assist your correspondent in his difficulties,—I am, yours, &c., T. Protheroe.

Wine Street, Bristol, June 25, 1877.

To the Editors.

Gentlemen,—In answer to your correspondent, E. Barry, who finds it a matter of difficulty when retouching negatives to alter and subdue the severity of expression often encountered, I send the following few suggestions:—

Instead of having recourse to books on facial expression, I should recommend a thorough course of study in black and white from casts, such as can be obtained at any of our Government Schools of Art. The knowledge of light and shade thus gained would be useful in photography as well as retouching; and by practising from antique heads or other good models your correspondent would at length find out the value of small touches, as they contribute to expression, and he would not only know what was to be done but would acquire the ability to do it.

Having stated what I should consider to be the best and most thorough way of learning something about the face and its aspects, it may yet be of use to have a few hints to go on with until they could be replaced by one's own taste after it had received proper cultivation.

When a person is under the consciousness of being obliged to sit quite still, if he wish the photograph to prove successful, he immediately "sets" the muscles of the face, it appearing to him, doubtless, a matter of impossibility to allow the muscles to relax and yet prevent them from bobbing about. What the retoucher wants to do in order to soften this grimness of countenance is to take his pencil and lighten the lines which give this expression, more particularly where they are deepest; this will have the effect of putting back or relaxing the muscles a little. Sometimes the direction of a line may be slightly diverted, but I should consider this rather dangerous to the likeness. I do not know how to remedy a staring eye in the negative, as nothing wants lightening, but a little shading under the top eyelid can be put in when touching up the print.—I am, yours, &c., F. Williamson.

Liverpool, June 23, 1877.

EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale*, that being done at a small cost in our advertising pages. This portion of our columns is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

Kinnear bellows camera for plates 12 × 10 either way, with two double slides, in case not much used, for a good lens—*carte*, symmetrical, or rectilinear.—Address, R. Pringle, Tanfield, Edinburgh.

Wanted, something useful in photography in exchange for a 52-inch spider-wheel bicycle in good condition. A 12 × 12 camera preferred.—Address, J. Hodge, 9, Coppenhall-terrace, Crewe, Cheshire.

A pair of Dallmeyer's No. 1B lenses, with camera, offered for No. 1AA and No. 1 wide-angle rectilinear, or 10 × 8 Ross large-angle C doublet.—Address, H. Dyball, 3, Lower Notting Hill-terrace, London.

Wanted, a pair of stereo., rectilinear, or symmetrical lenses, and a portable tent with glass bath, &c., &c., in exchange for a 12 × 10 rectilinear and two four and a-half inch best lantern condensers.—Address, David Young, Park View, Swinton, near Manchester.

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ANSWERS TO CORRESPONDENTS.

Photographs Registered—

William Livsey, Summerseat, near Manchester.—*View of Old Fleet-street, Bury.*

Edmund Wormald, Leeds.—*Portrait of Lady Mary Viner; St. Peter's Church, Leeds (interior); Two Views of Newby Church (interior and exterior).*

☞ *Correspondents should never write on both sides of the paper.*

In Type.—Communications from G. W. Webster, F.C.S.; John Laing, F.R.S.S.A.; Marcus A. Root (Philadelphia), &c. These we hope to include in our succeeding number.

Old Tom.—Yes; but not for the next two months.

Philo.—The radiometer, as at present constructed, is of no use as an actinometer.

T. F. H.—Make a saturated solution of bichloride of mercury in hydrochloric acid, and dilute this with eight times its bulk of water.

Lottie.—The individual named by you is not a photographer in the sense of being able to take photographs by either a wet or dry process.

J. T. L.—No. 1 is under-exposed and over-intensified, while No. 2 is quite well exposed but is foggy, from some cause or other to us unknown.

B. B. B.—Practically it is immaterial whether your condenser and optical system are made to revolve by clockwork, or whether they are quite stationary and the mirror moved by the mechanism. It amounts to the same thing in the end.

John S. Tait.—An edition in English of Dr. Vogel's *Handbook of Photography* is published by Messrs. Benerman and Wilson, of Philadelphia, price three and a-half dollars. It is probable that you may obtain it through Messrs. Trübner and Co.

X. Y. Z. (Leith).—Add to the varnish about a sixth part of its volume of alcohol; and, previous to applying the former, warm the plate a little more than you appear to have done. Try the effect of adding three parts of alcohol to one part of the white hard varnish.

An Old Reader.—With regard to your friend with the blue eyes and the florid complexion, the only suggestion we can make is to use a highly-bromised collodion and give a very full exposure. After every precaution it is probable that the services of the retouching artist will have to be sought.

Cordwainer.—A proper reflection in the water of any object upon or near the brink of the stream will not be obtained by printing from an inverted and reversed negative. This will be apparent if a looking-glass be laid flat upon a table and the relation to each other of the objects therein reflected be compared with those of the originals.

P. R. H.—Proceedings must be taken at the county court. We must decline offering any opinion from an *exparte* statement. Of course, if the matter be as you allege it is, then we should say you have the better side of the dispute; but if Mrs. F. were to give her version of the affair it is not impossible that we might consider her to be on the winning side.

A. B. C.—Instead of wasting time in an attempt to patch up the cracks with shellac, adopt the following method:—Provide a pine case a little larger than the bath, and having inserted the latter, pour in sufficient melted paraffine to fill up the space between. To prevent the formation of blisters place the prints in a strong solution of salt and water immediately after removal from the fixing bath.

W. B. S.—In making a silver bath do not trouble yourself in reading all that has been written on the subject of the bath, otherwise several months will be spent in doing so. Proceed as follows:—Obtain some good distilled water, and to every pint add seven hundred grains of nitrate of silver, which will dissolve in the course of a few minutes. Then coat a plate with ordinary iodised collodion, and immerse it in the silver solution for twenty minutes. Now filter if necessary, try a plate, and if the negative fog add one or more drops of diluted acid.

Geo. Smith.—The following formula for enamel collodion is furnished by a friend, who says that it provides a material which, in his hands, works with uniform excellence:—

Ether	5 ounces.
Alcohol	5 ,,
Pyroxyline	40 to 50 grains.
Castor oil	8 drops.

We need not devote space to a description of the method of using this collodion, as we feel assured from your letter that you are already very well acquainted with such details.

J. W. L.—With such a camera as we have proposed pictures of a kind suitable for lantern exhibition may be taken with the utmost facility. If the stereoscopic arrangement be utilised, any of the halves of the picture may be printed by superposition, forming a transparency of such dimensions as may be easily exhibited in the lantern. If it be necessary or desirable to produce a transparency the full size of the whole then recourse must be had to the camera itself as a means of producing a transparency reduced to any desired dimensions. If lantern transparencies be the primary object, we advise that two *different* pictures be taken on each plate. This is effected by exposing the first end of the plate to one view and the second to another.

G. Halero.—1. The drawing of the lens is quite correctly made; but not equally accurate is the manner in which the rays are shown to be transmitted. You must bear in mind that a convex lens converges those rays which fall upon it, and that the spherical aberration of the posterior lens is of a "negative" character.—2. In reply to your second query: let the two focal lengths be added together, subtracting from this the distance at which the lenses are mounted apart. Now multiply together the two focal lengths, and divide the last quantity by the first. This will give the focus of the projected combination, in which it is absolutely necessary to take into account the separation of the lenses.—3. The effect observed is that known as astigmation.—4. The test you mention is a very imperfect one for a photographic objective, although for a *telescope* nothing could be better.

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Photography in Court.—An Actress and her Artist.—*Dickenson v. Barry.*—This was an action brought in the Marylebone County Court, on Thursday, the 21st inst., in which the plaintiff, described as a photographic artist, formerly in business in Bond-street, sued the defendant, an actress, at the time engaged at the Princess's Theatre, to recover the sum of thirty guineas. Mr. Odgers, who appeared as solicitor for the plaintiff, stated that the defendant called upon his client desiring to have her photograph taken and an enlarged and highly-wrought picture to be painted. On being asked the price the plaintiff said it would be thirty guineas. About a dozen photographs of the defendant were taken in character, out of which she selected one to be painted from. For the purpose of colouring the defendant was required to sit, and the plaintiff had made several written applications to her for that purpose, but in vain; therefore, in April of last year, he finished the portrait and sent it to the defendant's residence in May Fair, whence it was returned on the following day to the plaintiff as an unfinished and very bad portrait, with a note to the effect that it was so very bad that she would not accept it. Subsequently several applications were made to the defendant for payment without success, hence the present action. The defendant was then placed in the box and denied that she had ever selected one of the photographs, as they were all very badly executed. She wanted the picture to be taken in costume to exhibit on a tour in America; but the colours in the costume were not correct, and made her "look more like an Egyptian mummy" than anything else in the world. The picture being produced in court, the defendant said it had been materially altered since she first saw it, and two witnesses were called who substantiated this statement. The plaintiff's solicitor addressed the court and said the picture would have been more highly finished had the defendant sat, as his client wished. After reviewing the evidence the Judge ruled in favour of the defendant, but it was clearly a case in which he would not certify for costs.

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METEOROLOGICAL REPORT.

Observations taken at 406, Strand, by J. H. Steward, Optician.

For the Week ending June 27, 1877.

These Observations are Taken at 8.30 a.m.

June.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks
21	29·94	E	57	64	79	54	Fine
22	29·64	W	60	65	73	59	Cloudy
23	29.73	NW	52	58	76	57	Dull
25	30·19	NW	52	59	74	51	Cloudy
26	30·12	W	58	65	70	52	Dull
27	30·13	NW	58	60	69	56	Dull

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 896. Vol. XXIV.—JULY 6, 1877.

THE FOGGING PROPENSITIES OF PORTRAIT LENSES.

Previous to plunging *in medias res*, the title selected for this article demands a few words of explanation. Portrait lenses, when properly constructed, when in good condition, and when rightly used will not cause fogging of the image; but if there be anything at all abnormal in these respects they may do so, and it is in accordance with the experience of numerous photographers that this bad effect is often produced. Our theme at present, then, is connected with lenses which either in construction, condition, or utilisation do not necessarily fall under any of these categories.

We have not infrequently heard of lenses against which the possessors conceived that they had good cause for bitter complaint. When originally procured they were acknowledged to be all that was right and desirable; but in course of time, and after they had been engaged in the arduous work of "portraitising" from morning to night for some months or years, they gradually showed indications of deterioration, such lapses assuming the guise of flatness and incipient fogginess in the negatives, which were now quite lacking in that purity and vigour of tones at one time so easily obtained.

It is not in any change induced by light in the glass of which lenses are made that we are to look for the cause of the decadence to which we have referred. It has been a favourite idea with some that the light which is from day to day transmitted through the lens produces a change in the glass; but this idea is not tenable, because the few rays that are radiated from the sitter while a negative is being taken are so feeble as to be incapable of affecting the glass, even if an exposure were prolonged continuously for several years. Moreover, the change that is induced in glass by means of light is one which would have a quite opposite effect upon the sensitive plate than the production of fog, inasmuch as it is proved by the numerous experiments of Gaffield that the action of light is to degrade the colour of glass, and hence, in the case of a lens, to make it slower and less liable to fog than before.

We have recently made a study of several lenses in which the fogging propensity was developed to a large extent, and find that in every case it has proceeded from the same cause, namely, reflection from certain portions of the inside of the tube. If a portrait lens be held up in a horizontal position against the light a little below the level of the eye, it will be found that in some instances there is a large volume of light radiated, and in other cases *reflected*, from portions of the brass-work. This is especially the case with certain French combinations, in which the lenses are fastened in their cells by means of a counter-screw formed of a piece of tube varying in depth from a quarter of an inch to an inch. In a quarter-plate lens which we have just had subjected to measurement the depth of these rings is precisely three-eighths of an inch; and in a whole-plate combination made by a very respectable Parisian optician the rings measure nearly an inch in depth.

Now, no matter in how perfect a manner the interiors of these counter-screws be blackened with varnish, and no matter how "dead" be the surface, the photographer will not clean the lenses many times before the dead surface will acquire a certain degree of gloss which, as the interior plane of the counter-screw stands at an angle so exceedingly favourable for reflection, inevitably throws a beam of reflected light into the camera, and thus fogs the plate.

What is so true of the counter-screws applies with equal force to every other portion of the inside of the tube of a lens. The act of wiping off the dust by means of a soft wash leather from the exterior or interior surfaces of the front combination serves in numerous instances to start into fatal and reflecting activity a hitherto dead surface, and we know of several instances in which, owing to this cause—unknown at the time to the photographer—an elaborate system of box-hoods with small square external apertures have had to be provided for the lens in order to make it produce those bold, vigorous images which without such adjunct could not be obtained.

To English opticians is due the credit of having reduced these reflecting surfaces to a minimum. By blackening the edges of the lenses themselves previous to mounting them in their cells a once potent power for evil has been eradicated; and almost equal in respect of gain is the advantage arising from burnishing the lenses in their settings in such a manner as to leave no projecting portions of brass-work unless such, by its special form, be rendered quite innocuous.

We have found several desperate cases of fogging cured by adopting the expedient of pasting a narrow velvet ribbon inside of the counter-screws, with broader pieces attached in a similar manner to the hood and the inside of the tube. An excellent method of curing lenses of this propensity is to paint over all the interior, including as much as possible of the cells and counter-screws, with gold size, and then dusting it all thoroughly with pulverised black cloth or "flock," which can be obtained from the manufacturers of paper-hangings. There is no case so desperate as not to succumb speedily to this treatment. If those photographers who, prompted by a perusal of this article, subject their lenses to examination and find that light is reflected from the interior fittings of the tube, even if *black*, are led to adopt the remedy here pointed out they will find in the increased vigour and "pluck" of their negatives their reward for the slight amount of trouble they may have had to encounter.

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OBSCURED GLASS IN THE STUDIO.

The frequent queries we receive—as shown by our column of "Answers to Correspondents"—relative to the advisability of using obscured, that is, ground or roughened, glass for glazing the studio with, lead us to believe that some hints upon the subject will be welcome to many of our readers. There is, we apprehend, scarcely a topic to be found in the whole range of photographic literature which has been equally well discussed, or upon which more misapprehension and more variety of opinion, and opinion of a very decided character, exists.

We have met with artists who entirely pooh-pooh its adoption, and others who believe in it as a panacea for all the ills that photographic portraits are heir to. Some would use it, but their studios are already fitted up with plain glass; and, again, there are others who have used it and cast it off. There are studios with a considerable proportion of the roof fitted up with it, others with none, while others, again, receive their light almost entirely through this medium. But with all this variety of opinion we have met with but few operators who had a thoroughly satisfactory and logical reason to offer for the views they have thus held.

We remember, some fifteen years ago, a striking example of its usefulness being brought before the notice of the societies by a gentleman who had built a studio with that most heterodox of constructions, a south light, and by the aid of obscured glass found himself able to take such pictures as led him to prefer that arrangement of illumination before all others. This, no doubt, was an example, such as occurs in photographic practice with considerable frequency, of an artist becoming accustomed to a certain arrangement, and from continued use getting such power of handling it as to lead him to extol the excellence of his system, when really the merit lay in his mastery of it. Much has been written of late to resuscitate the old idea of blue glass in the studio, which, it will be remembered by some of the older practitioners in the art, received much attention many years ago; but few who attempted its use gave themselves sufficient time to find out all its advantages as well as disadvantages, and so it has almost fallen out of recollection. But we know of a conspicuous example of preference for obscured over every other kind of glass by a gentleman of great skill and practical acquaintance with the details of photographic manipulation—Mr. Keith, of Liverpool—who has a fine studio entirely glazed with cobalt blue glass, and who speaks most highly of it.

Now, *à priori*, one would expect the use of blue glass to be followed by certain disadvantages. Thus it is perceptibly slower than so-called colourless glass, that is, ordinary window glass; but preference is given to it by the gentleman we name on account of the soothing effect upon the eye produced by a room which is illuminated only by a light with this delicate violet blue shade imparted to it. That it does obstruct light is easily seen by allowing a piece of silvered paper to be acted upon in two different places through the cobalt glass and through ordinary window glass; the difference in the depths of tint will be very decided. As a set off to this disadvantage there remains the fact that, whatever the position of the sun in the studio, there is always a light most agreeably soothing to the eye.

This leads us to the main distinguishing feature of the obscured glass. Placed over a piece of silvered paper, and put in the light side by side with a piece of plain glass which covers another portion of the paper, it also will be observed to obstruct the light to a marked extent, and yet, paradoxical as it may appear, we assert that in many cases the adoption of some proportion of obscured among the other panes would result in a decided gain in the light received upon the sitter. Observe we say "upon the sitter;" light in any other place, except in a small degree upon the background, is worse than useless, though the general effect of lightness of the studio too often guides photographers in their estimate of its capabilities. The value of light is only to be reckoned by its fall upon the sitter.

When a ray of light strikes a piece of clear glass it passes through practically unchanged, a small amount being lost by absorption and reflection. Let, now, one surface—say the second—be roughened by sand, and the ray is entirely changed in character, being broken up and scattered in almost every direction; and hence it needs no argument to show that if a single ray of light only fell upon a small window which formed the sole means of illumination to a room, one spot only in the room would be lighted if plain glass were used, and the other parts would be almost pitch dark, any object or portion of the room away from that spot being then practically invisible. If ground or obscured glass were used the whole room would receive a share of the light, and no object in it would be entirely dark.

And so it is in a studio. Whatever light strikes the glass is sent, in part, to the sitter and the rest all over the form, wherever obscured glass is used. Against this it may at once be urged that these very considerations are, therefore, a complete argument against its use; and, under certain circumstances, so they are. It is very true that there is too often a deficiency rather than an excess of light in the studio, and that in such cases it is a mistake to weaken what there is by dispersing it. But here we make our point. Owing to the presence of surrounding obstacles, buildings, &c., it frequently happens that the light is obstructed, and that portion of the heavens from whence we might otherwise be able to obtain much light is entirely hidden by a huge wall or a slated roof. In that case no amount of increase of clear glass roof interposed in the line between the sitter and the obstacle will have the slightest effect in increasing the illumination of the sitter, for such glass in the roof is only valuable where an unobstructed view of the heavens can be obtained. The value, or otherwise, of a window, as regards its power to give light to any spot, can always be estimated by the operator stationing himself at the place and looking through the window. If the uninterrupted heavens meet his eye the window is of use; but if he see bricks and mortar it is useless; and if it were entirely covered over no loss of an appreciable extent would result. If, now, remaining in the same position, the operator observe the effect when ground glass or its equivalent is substituted he will perceive a most marked change if any light from the sky fall upon it. He will see before him a white light where before was red brick, and to this extent will the illumination be increased—the light which, passing through the window, would have fallen upon the floor or wall, is now dispersed, a fair share of it falling upon the sitter. This experiment, practically applied on a large scale, indicates which portion of a glass roof must have plain and which obscured panes. We may positively say that all those of clear glass which in the manner we explain showed the brickwork obstacles might just as well be pasted over with brown paper for all the good they are in lighting up the sitter. It is thus easy to see how the divergencies of opinion we have noted have come to exist. Ground glass of itself obstructs some light taken as a whole; but by reason of its dispersing powers there are cases where it increases available light. Thus we might instance two studios constructed in exactly similar shape, where in one ground glass would be a great advantage and a disadvantage in the other, the surrounding buildings being the guide in forming a judgment.

There is now another aspect in which the subject may be looked at. In studios built in such a way that the sun shines in at certain hours ground glass softens the intensity of the rays to such an extent that it is possible to take excellent pictures when the sitter is posed even in the direct path of the sunbeams. In the middle of the summer the ordinary ground glass of the dealers is not dispersive enough, and two thicknesses would have to be used. But in the winter and spring months this would not be needed, so that in practice, if the studio be permanently glazed with one thickness, it will answer in winter, and a movable blind may be added in summer, or at such times as the light is too strong. There is no gain without a corresponding loss, the loss in this case being those occasions in which no sun is visible. The light then is weaked considerably, and so much so that in a studio built in this direction, lighted on one side only with an unobstructed view, we decidedly advise that clear glass only be used, and the direct rays tempered when necessary by the use of movable screens of tissue paper, tracing cloth, or some such material.

We close our review of the various points of view by adverting to one other argument. Taking a room with a clear view and plenty of light, it may be pointed out that in our climate the atmosphere varies so much that, with a given arrangement of blinds, the actual amount of direction and power of the light alters every minute, according as masses of white clouds vary their relative position, and that if obscured glass were entirely employed the light would be softened—that is, more generally diffused. And this would be quite true, and it would further be an advantage on a bright but changeful day to have a studio so glazed; but on duller days (and we have a sufficiency of these), with a light of utter and complete uniformity—the uniformity of dull, grey cloud—so much light would be obstructed as to become too serious a drawback to be tolerated. To sum up our opinions: we say with a clear, unobstructed light use plain glass. If much built in use ground glass in the way shown. If a studio have a two-sided light use ground glass on the sunny side.

EXPRESSION IN RETOUCHING.

In the correspondence column of the issue of this Journal for June 22nd there was an inquiry, evidently by a thoughtful and earnest mind, on the means to be employed to gain an effective knowledge of retouching in the direction of altering expression. I am not now going to discuss the merits or the advisability of the practice of retouching—they have been discussed *ad nauseam;* I myself have, besides, already given my opinion upon the matter in these pages some years ago. It is possible the hints I here give in reply to Mr. Barry's request may be useful, as he says, to others as well as to himself.

His request is, in fact—"Where must I go to get lessons in expression, and what book shall I study?" The most truthful reply he could get (and I am much inclined to think it would be the most satisfactory one in the end) would be—"Go to the book of nature. Study life in the living model; let every face you see be the page of an open book to be got off by heart." The true artist would instinctively feel that such advice was right; but the utilitarian would say he had no time—he wants a royal road to learning.

Hogarth—one of the most perfect delineators of the human face in all its modes and passions—has combined in his drawings perhaps more variety of facial expression than any artist before or since. His power of caricature was unparaleled; but to obtain such command over his brush he studied life only, and human features above everything. Whenever he saw a striking character he took means to transfer it to his "sketch book," which, often enough, it has been said, consisted of his thumb nail! A thorough and intelligent study of his works could not fail to be of great benefit to anyone aiming at obtaining power with his retouching pencil, and, combined with the daily study of faces in the operating-room, still more insight would be gained into the hidden guides to expression.

The studio portraitist must gradually attain to the state of mind shown in Hogarth's reply to Bishop Sandford's mother, who, when young, was expressing her admiration of his skill in caricature, and wishing she had a similar power. "Alas! young lady, it is not a faculty to be envied," he said. "By the long practice of it I have lost the enjoyment of beauty. I never see a face but distorted; I never have the satisfaction to see the human face divine." I do not hesitate to say that the thoughtful portrait photographer gradually, but, of course, to a lesser degree, falls into such a frame of mind as is here portrayed. Every sitter I take I must carefully, though, apparently, carelessly, scrutinise that I may find the best view and discover the features that are most disproportionate or unsymmetrical, a slight turn of the head or an insignificant alteration of the light often sufficing to modify these least desirable characteristics. So much has this habit of analysis become a part of me, that I am not guilty of exaggeration when I say I scarcely ever see a countenance now as most persons would see it. There are few symmetrical faces to be met with in the universe, and thus it is that "the beautiful features," "the classical face," "the play of expression," &c., present themselves to me as odd-eyed, crooked-nosed, or distorted-mouthed. Yet this very power of analysis, if I spent my time entirely in portrait painting or negative retouching, would be of incalculable benefit.

But there is one important bar to effect of the kind I am speaking of in retouching. Though to a limited extent, by screening a negative, we are able to give power to a shade or a half-tint, we are practically unable to produce an effect by adding a *dark* touch to a face. We are, to all intents and purposes, confined to producing effects by modifying, lightening, altering in shape, or removing already-existing lines or masses of shade, and hence our power over expression is still of a very limited nature, though occasions often arise when even this limited power enables us to produce most remarkable improvements; but to look for the producing of more than these changes would lead only to disappointment. The method of making some of these alterations may be conveyed in a few words, after the manner of a process or a "dodge;" but Mr. Barry's method is far the best—that of studying drawings and books.

Of late years, however, among painters there has arisen a tendency to work more from nature, and to disregard some of the recognised and traditional modes of illustrating the passions and emotions which have been followed, somewhat after the fashion of the stage-dresser, who, with a few touches of burnt cork in the recognised place, can on the same face produce fair imitations of all characters—from the calculating villain to the jabbering idiot. I am not sure that this later tendency has not been intensified by a study of Darwin's *Expression of the Emotions*, where, by means of a number of photographs and engravings, many literal representations of faces under the influence of emotion are to be found. The study of this work would be most useful to the retoucher, and almost every possible method of changing the face may be found in it. The work is now some years old, and, I believe, is readily obtainable at half-price at some of the circulating libraries, such as Mudie's, &c.

The most important work published especially treating on expression—one printed for the use of artists—is Sir Chas. Bell's *Anatomy of Expression*, which is justly entitled to a place among the classics of art. The various modes of expression are analysed, and the nerves and muscles brought into play are described and drawn. It has numerous plates depicting a great variety of expressions, and, taken as a whole, is a most instructive and readable book—one that should find a place in every photographic library. It is referred to in Darwin's work I have just named, and a careful comparison of the two works will form a very interesting study for many a half hour. The large-paper work has passed through six editions, and has lately been published in a cheaper one—at, I believe, seven shillings and sixpence.

Another series of plates alone, with no letterpress but a few brief remarks at the bottom of each, describing the method of portrayal of the passion indicated, and the mode wherein it differs from other slightly-similarly indicated or an entirely opposing character, is Lejeune's *Passions*, which consists of a number of engraved plates, each containing one head depicting the special passion named below it. All the traditional modes of drawing the emotions are here preserved.

I must not forget to mention that an edition of Hogarth's works, with photographic reproductions of the original plates, was published not very long ago at a guinea. Every line of the original plates is here given, and they form a repository of facial caricature and character that would be most useful to a retoucher with a desire to excel in his art.

I will conclude with a few words especially intended as a reply to the note which suggested to my mind the possible usefulness of a description of some of the works which, as a practical photographer, I have found it worth while to add to my library. Mr. Barry has rightly supposed that the chief seat of expression is in the mouth, eye, and brow principally. The commonest point which alteration may improve is the frown, mostly caused by the strong light on the eyes. The chief effect of this is to give to the eyebrows an angular point at the ends nearest the nose. Below this angle the shadow is increased, and upwards a line of greater or less depth is formed. The great point is to take off the angle and to lighten the shadow immediately beneath it. This effects more even than taking out the line or wrinkle. When a smile comes over a face it is first shown in the eyes by a wrinkling of the lower lid, which appears less curved and slightly cuts across the iris of the eye, destroying the completeness of its circular form by apparently flattening the lower part of it. The nose partakes of the same action, the wings being slightly drawn up and the nostrils thus widened. These indications are all increased as the smile increases into a laugh. The line from the alœ of the nostrils to the corners of the mouth becomes more centered by the action of a smile.

The mouth, when not influenced by any mental excitation, has, as most photographers are aware, a tendency to look stern rather than otherwise. When a smile comes over it, *one corner* is slightly *raised* and the mouth on that side is apparently lengthened. A very gentle smile *never* influences both sides of the mouth; it is only when it becomes very pronounced that the upward direction is given to both sides. The mere description of this action will point out to the retoucher wherein his pencil may influence the expression.

I have pointed out leading characteristics in facial change. I advise Mr. Barry, or anyone who wishes to obtain the power he desires, to study the works I have named (or to read my description) carefully, and *then* to place himself before a mirror and observe his own features, making his own notes thereon. If afterwards he again studies the works I have named with this foundation of practical observation, I think he will obtain all he requires.

I must conclude by saying a knowledge of drawing is of infinite usefulness to a retoucher. G. Watmough Webster, F.C.S.

BROMISED COLLODION PROCESS—DRY AND WET.[*]

The number of preservatives is very considerable, and it is, of course, right to select that which gives the best results with the special dry process that may be used.

I have studied the properties of these preservatives on sensitive films. The properties of preservatives are, no doubt, well known. First, they give a certain degree of permeability to the collodion film. Second, they remove all traces of free nitrate of silver without injuring the sensitiveness. Third, they aid the reducing action of the light by their affinity for iodine and bromine. The best preservative, therefore, should possess these three properties.

When we employ sensitive films containing a large proportion of bromide of silver we sometimes discard the use of any preservative but in this case the plates are less sensitive. I submit the formulæ of the preservatives with which I have obtained the best results:—

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[*] Continued from page 307.

ACETATE OF MORPHIA.

Water	3½ ounces.
Acetate of morphia	8 grains.
Glacial acetic acid	a few drops.

Apply to the sensitive film and allow to dry. This gives excellent results, assists the sensitiveness for the less actinic colours, but the plates will not keep any great length of time, two or three days being a reasonable time; the sensitiveness also decreases rapidly. This preservative will remain good for a considerable period.

ACETATE OF MORPHIA AND PYROGALLIC ACID.

Acetate of morphia	8 grains.
Pyrogallic acid	2 ,,
Acetic acid	4 drops.
Water	3½ ounces.

This gives much better results than the acetate of morphia solution alone, and increases the sensitiveness to a high degree; its preserving powers are also great.

HYDROCHLORATE OF MORPHIA.

Water	3½ ounces.
Hydrochlorate of morphia	3 grains.

The sensitiveness is similar to the acetate of morphia solution alone, but the plates will keep longer; the sensitiveness, however, rapidly diminishes.

These three preservatives with the salts of morphia have the advantage of dispensing with washing the film before developing.

EMELINE.

The results obtained by the morphia (recommended some time ago by M. Bartholomew) with the addition of pyrogallic acid are satisfactory. I find in the impure emeline resulting in the decoction of ipecacuanha all the necessary elements. I obtained this preservative with very great facility by boiling in a porcelain dish for about twenty minutes—

Distilled water	20 parts.
Ipecacuanha root (powdered)	1 part.

This decoction—which is composed of emeline, gum, sugar, gallic acid, and a resinous substance which is injurious, and is precipitated by boiling—must be filtered. This preservative keeps a long time in a cool place. Its properties can be altered by placing in it a few drops of acetic acid; this addition increases the rapidity of the emulsion. The results are very similar to those of the salts of morphia.

COFFEE.

Water	3½ ounces.
Ground coffee	77 grains.
Lump sugar	30 ,,

The above must be boiled for a few minutes, allowed to cool, then filtered, when the following is added:—

Gum arabic	30 grains.
Sugar candy	4 ,,

Filter again and set in a cool place, and it will retain its good qualities for about a fortnight. It should be applied several times on the film and allowed to dry. Before developing it is necessary to wash the plate. The coffee can be replaced by tea, hops, quassia, poppy, &c. All the infusions of materials containing tannin, such as the bark of oak, walnut, birch, &c., produce similar results.

Caffeine is the principal agent contained in the coffee preservative. When the coffee is used without having been burnt it makes the image very feeble. When too much burnt the negative becomes intense, but the addition of gum arabic establishes harmony and gives excellent results.

Gum only makes the negatives very clear, but, when mixed with coffee, it regulates the difference of intensity and the results are good. This preservative gives less sensitiveness, but the plates will keep a long time before and after exposure. The plates must be washed with water prior to developing. ERNEST BOIVIN.

—*Le Moniteur de la Photographie.*

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WET, MOIST, OR DRY?

I BELIEVE there are few thoughtful photographers—men who keep themselves abreast of the times, posted up in all that is written concerning the profession in which they are engaged—who do not believe that, sooner or later, an emulsion process must take the place of the present almost universal method of preparing the sensitive surface in the bath; but, for some reason or other, probably various reasons, few care to take the trouble to act as pioneers in bringing about the change. Why this should be is somewhat difficult to understand, as, *cæteris paribus*, the advantages in point of comfort, economy, and quality of results would be very considerable.

I have long been in the habit of recommending the practice of photography as one of the best means of mental training that could be adopted, and showing that it naturally led to an acquaintance, in some degree at least, with art, chemistry, optics, mechanics, and other branches of science; but, while thinking over the matter from the present point of view, I almost feel that it is necessary to reconsider the question, as, in addition to its advantages, one is almost forced to the conclusion that it tends to foster a degree of conservatism altogether incompatible with this progressive age. It will be generally admitted that at no period of the world's history have science and manufacture made such rapid progress as during the last quarter of a century, every suggested improvement having been eagerly seized upon and adopted, with the result that during that period both have been almost revolutionised. But photography—or what may be called practical professional photography—has really stood still, the *modus operandi* by which a portrait negative is produced being pretty much the same today as it was twenty-five years ago. Why this is so is not at present the object of my inquiry, so much as to show how it should cease to be, or rather to throw out several hints as to the reasons why an improvement should be aimed at.

In the best-regulated and most successful establishments the sensitising of plates in the bath as they are required occupies much time, and the dust of the dark room, where operators are constantly on the move, gives rise to faults in the negatives which need the aid of the spotter or retoucher. Then the bath *will* now and then get out of order, and even when it does its duty well it is subject to constant change, which requires an equally constant attention to keep it anything like up to the mark. Then, even when all things are in the most perfect order, the resulting negative, while capable of giving excellent prints on paper, is quite unfit for the highest class of enlarging purposes, the deposit being so granular as to give most unseemly results when magnified a few diameters.

Thanks to the perseverance of the noble band of experimental amateurs emulsions are now made whose stability and constancy may be relied on, and the introduction of which into the professional studio would tend much to deliver the photographer from most of the ills to which he is at present subject. During the early morning, before the dust has risen, or after the bustle and business of the day, plates sufficient for a day's work might be prepared as rapidly as collodion can be poured on and off, and, while ready at a moment's notice for exposure, they would on development show a complete immunity from the troublesome family of streaks, stains, and pinholes so detrimental to good work. Then, while the negatives might not be better for printing purposes than those produced in the ordinary way, they would be found, in cases where enlargements were required, all that could be desired, the deposit, even under a high magnifying power, appearing simply as a stain.

So far, I believe all who have given much attention to emulsion work will agree with me, and urge the adoption of a moist emulsion plate for ordinary studio work, under the general impression that moisture in some form is essential to rapidity; but I am inclined to go further, and raise the question as to whether a moist plate be really more rapid than a dry one. In some cases no doubt they are, but there are others in which they are not. I have recently seen a number of experiments made with an emulsion which is admitted by those most competent to judge to be more rapid when in a moist state than ordinary wet collodion, and have had most abundant evidence that it at least gains considerably in sensitiveness in drying. In such a plate I have just developed a negative after an exposure of twenty seconds in a dimly-lighted studio, and it is in every respect better in delicate detail and all good qualities than a wet collodion plate exposed immediately before for thirty seconds. Now what one man has done another may do, and, although I am not at present able to give the method by which the plate was prepared, I may say that it is a modified gelatine process, which ought to be sufficient to set those interested on the trail.

However much may be expected from a moist process there are many advantages appertaining to a dry method that must in the end lead to its universal adoption. Although a plate may be kept moist for a day or two, the degree of moisture will vary, and with it there must be variation in sensitiveness. Then the moisture occupies space and presents the film to the light in a more or less spongy form; and when the film dries, after development, the atoms are not exactly in the same relative positions as when acted by the light. This fact may account for the absence of the clear cut sharpness of some of the fine lines that is often noticed in a negative that has been exposed moist, especially when the film is thick.

Granting, then, that a film can be made that in the dry state shall be as sensitive as ordinary wet collodion—and of this I have not the slightest doubt—it is surely the interest of portrait photographers to make an effort to overcome the prejudices of education and habit, and give it a fair trial. If a few of our best men will do this, and publish the results of their experience, I have little doubt that before the present season is ended the bath for ordinary work will be a thing of the past, and many of the hitherto unprofitably-employed hours of the coming winter days be occupied in the preparation of a stock of plates sufficient to last during the whole of next summer.

In all this I have mainly urged expediency as the reason for the desired change; but I know that there are many who aim, above all other considerations, at the production of high-class work. To such I say, make a transparency on a wet collodion plate from a wet collodion negative and one on an emulsion plate from an emulsion negative, place them in the lantern and compare the magnified images on the screen, and the result will show that expediency is not the only advantage likely to arise from the substitution of an emulsion for the bath. JOHN NICOL, Ph.D.

NOTES ON PASSING EVENTS.

By a Peripatetic Photographer.

I have been waiting with great impatience for the last three weeks to find some description by our Editors—one of whom is said "to know *a lens* when he sees it"—of that last new thing in photography, the *new* lens "made by Voigtländer and Son, from the calculations of Dr. Somer." I confess to a feeling of deep disappointment in not having yet come across such description. Common courtesy to Dr. Somer as well as to the Herren Voigtländer compels me to say that, judging from the advertisement which formed a supplement to The British Journal of Photography of June 15th, the lens is bound to be a useful one; but, having admitted this much, I would ask Dr. Somer in what consists its novelty—in what direction, in short, am I to look for its *specialité?* I find that it is stated to be *symmetrical;* but this is a characteristic of all the rapid cemented combinations that have been floating about this "tight little island" of ours for quite a number of years. It is *aplanatic*—that is, it works with full aperture; but this is also true of all the rapid lenses aforementioned. It is *free from distortion,* but it is over a dozen years since any optician dared to manufacture a distorting combination of lenses; moreover, when a combination is symmetrical (quite apart from any trade application of this term) the difficulty will be in producing distortion rather than in obtaining immunity from this once rampant evil. The ratio of aperture to focus is said to be about six to one, or, to borrow and use the usual optical slang, $\frac{f}{6}$; "the light also is spread equally all over the plate"—a sentence I borrow from the business announcement from which I am quoting. Let me, as a mere outsider, ask, first, if $\frac{f}{6}$ is to be considered something abnormal in the aperture of lenses? Because I read that at the meeting of the London Photographic Society held in January, 1870, Mr. J. H. Dallmeyer exhibited a lens formed on the principle of his well-known "rapid rectilinear," which had an aperture of $\frac{f}{4}$, which is more rapid than $\frac{f}{6}$ in the proportion of sixteen seconds to thirty-six seconds. I am carefully avoiding the question of the desirableness, or even the general practicability, of using such apertures for landscape, copying, or general outdoor work, and am here confining myself to the question of novelty. But I must take occasion here to ask Dr. Somer, or the compiler of the Vienna circular which forms the text for these remarks, what is meant by the light being "spread equally all over the plate?" Is it possible that an attenuated and far-travelled oblique ray can equal an intense central ray?—or, in other words, that an acute angle is equal to an obtuse angle? The *data* at command forbids me from saying that such revolutions in physical science can be accepted as accomplished facts. But, Goethe-like, I wait for "light, more light."

In no small degree have I been "exercised" in my mind of late with regard to what our Editors have designated *platinotypes.* "What is a platinotype?" perhaps a neophite inquires. I reply, it is a photograph in platinum produced by a process invented by Mr. William Willis, Jun. Wherein, I ask myself, does this process, or rather product—for it is the finished print I am to deal with—differ from a silver print as obtained in the ordinary manner? It has been said by our greatest authorities on toning that the principle of this action consists in the substitution of gold for silver in the print. But if platinum toning be substituted for gold toning—a suggestion made and partially acted upon many years ago—and if the auric principle be still acknowledged, wherein consists the difference between a platinotype, *à la* Willis, and a quondam silver print that has passed through the colorific ordeal of a bath of chloride of platinum? If the result in the former case be platinum, will not the result in the other instance be platinum also? I throw this out as a rather hard nut for printing casuists to crack.

Very glad was I to perceive, in a paper by Mr. Peter Low, contributed to the Edinburgh Photographic Society, a remark respecting the mistake made by young photographers in imagining that a great deal depended on the amount and variety of the compounds used by them. But, when I looked into the accompanying formulæ for a practical "outcome" of such an excellent implied principle, how astonished I was to find in his formula for a developer not only the protosulphate of iron, which every tyro knows to be the active agent, but a something designated as "iron of ammonia." Now what, may I venture to inquire, is iron of ammonia? "Not such a thing known in London," was the curt reply to a query I put at one of the largest manufacturing depôts in the metropolis. Now why, in the very face of an expressed desire for simplicity, does the essayist depart from his routine path and annoy us with this red flag of an unprocurable something that we are bound to consider beneficial in a high degree, otherwise it would not be ranked on a par with sulphate of iron as respects the quantity required? I am, however, led to question the excellence of the process as a whole, because I find—as a part and parcel of the process detailed, mind you, for encouragement for amateur photographers and beginners in the art—instructions how to give the negative a surface that will enable it to take the pencil so as to improve such negatives by retouching. How much better would it be if some one gave to beginners instructions enabling them to produce good negatives which would not require to be worked upon with a pencil in order to patch up defects?

If Mr. B. J. Edwards managed to obtain a fee of two guineas from certain photographers for telling them how to make a silver bath with water from which all the organic matter has been removed, and of rectifying a disordered bath by partial evaporation over a gas stove and making up to the proper strength with the same description of water, what kind of fee ought to be given either to Dr. Vogel or to Mr. A. L. Henderson, who, by the introduction or advocacy of an addition of nitrate of barytes, have so greatly conduced to the elimination of fogging, pinholes, and all those other minor evils to which the silver bath was liable to such an exceptional degree? By parity of reasoning twenty guineas would be too little to either of these men. But while the courage of Mr. Edwards, in asking a fee for such information, is to be commended, I must decline to say a word in favour of the example.

Right glad am I to see an attempt made to stamp out a nefarious practice indulged in by several photographers, namely, the exhibition in their showcases of specimens executed by others than those photographers themselves. If an unfortunate chemist's assistant utilises the name and abilities of some other man to enable him to obtain a license to dispense drugs he is, very justly, punished for doing so, and of this several instances have occurred during the past month; but in what respect, morally speaking, does the photographer who exhibits as his own the work of another man differ from the dispenser of drugs? Both are guilty of knavery; and it would be well if some one possessed sufficient public spirit and spare cash to have some one perpetuating this plague spot dragged before a court of justice, in order to obtain an expression of judicial opinion on such impudent charlatanism.

(To be continued.)

SIEMENS' PRESSURE-HARDENED GLASS.

[A communication to the Polytechnic Society of Berlin.]

Everybody knows that some two years ago M. Roger de la Bastie published his discovery of how to toughen glass; and, naturally, the discovery caused great excitement in glass-manufacturing circles, and the office-bearers of the German Glass Manufacturers' Society, to which Herr Siemens belongs, determined to pay M. de la Bastie a visit, in order to arrange for making his important discovery as cheaply available as possible to the German manufacturers.

We were (said Herr Siemens) very well received, and were shown numerous experiments with small plates of glass and watch glasses, which certainly gave evidence of a remarkable power of resisting blows, pressure, and changes of temperature; but the hardening process itself was not shown to us, though, from various observations and the remarks of M. de la Bastie, we were able to form a superficial idea of it. We were less successful in arranging for a cheap permission to learn the secret and use it in Germany. M. de la Bastie's terms were so high that the purchase of the discovery was quite out of the question. On our return home I tried to imitate the process, which I soon succeeded in doing, as will be seen later, quite in the original French way. Meantime Herr Pieper, an engineer, had produced hardened glass by another method which he had patented, and sold comparatively cheaply to the Society of German Glass-blowers. Unfortunately, Pieper's method was found to be impracticable, or at least it has not yet been put to practical use.

It is well known that the peculiarity of the French process consists in putting the finished articles back into a special oven and heating them until they are red hot, and when in this condition placing them in a specially-prepared cooling bath. This process, as well as those above mentioned and founded upon it, succeeded only when the glass articles were perfectly finished before being subjected to the hardening process. This circumstance alone has the effect of greatly increasing the price of the articles, and it is accompanied by other drawbacks. For instance: if a glass vessel be heated to the degree required by the hardening process, the glass becomes so soft that it is scarcely possible to lift the vessel from the oven to the bath without causing a greater or less injury to its shape. This is the reason why so many of the toughened glass articles that find their way to the market, especially sheets of glass, are bent. Another inconvenient and very costly condition is the peculiarity of the cooling bath. As you are aware, the cooling bath consists of tallow, oil, or some other fatty substance which must be heated to 200° or 300° C., according to the quantity of glass to be hardened in it. When the red-hot glass is plunged into this highly-heated fat or oil the bath might easily take fire. Of course this danger may be either almost wholly removed or reduced to a minimum by proper precautions; still the risk is always there, and, in consequence of its liability to take fire, the bath has always a penetrating and disagreeable smell. A great quantity of fat or oil is also consumed, as, by contact with the glowing glass, a continual decomposition is going on, so that the bath requires to be often replenished or renewed. Besides all that, every pot of glass requires a bath of a different temperature, and it is very difficult during the hardening to maintain it at exactly the same temperature, so that it would seem as if the bath were destined to remain a very weak point in the toughening process.

Herr Siemens has devoted great pains to bringing M. de la Bastie's hardening process to a practical conclusion; but he was soon convinced that another plan must be followed if any real benefits were to be derived from the new invention. Besides the costliness of the process, it was impossible to produce many things—such as sheets of glass—in anything like a useful size or shape, and to Herr Siemens it seemed that hardened sheet glass was, above all others, the article which was most likely to find a practical use, and of which there was an actual want. It also seemed necessary to find a process by which any interference with the form of the hardened articles should be prevented once for all.

In following out this idea it occurred to Herr Siemens to use solid substances, having the form or mould of the articles to be hardened, to cool them instead of the cooling bath. The first attempt to harden small sheets of glass between clay plates showed clearly that this plan might lead to practical results, and now the results lying before the Society testify to the correctness of this inference.

Almost a year and a-half has elapsed between the above mentioned first and imperfect attempt to produce pressure-hardened glass and the now comparatively successful results, which, however, have not yet been brought to a final end, as new advantages and other ideas for improvements are continually cropping up.

The pressure-glass-hardening process is not merely a hardening process, but a real glass manufacturing process, in so far as that it gives the articles their form. It may also be employed for ornamenting the upper surface of glass with a pattern, so that under certain conditions the hardening, shaping, and ornamenting of a piece of glass may be performed by a single operation. The peculiarity of the manipulation does not allow of all glass articles being hardened by this process, but only those which can be pressed between simple moulds, and therein consists its peculiar applicability to sheet glass. At present Herr Siemens has limited his glass manufactory at Dresden to the production of this one article, but intends in time to extend his operations to the production of other suitable articles, such as plates, tumblers, bowls, cups, &c.

On considering the new processes—M. de la Bastie's and Herr Siemens's—one may fairly assume that they will not compete with each other, but that each will find a sphere for itself. M. de la Bastie's is best adapted for cylinders, hollow tubes, and other articles of a complicated form; while that of Herr Siemens is confined exclusively to sheet glass and simple forms.

M. de la Bastie, says Herr Siemens and others, claims that the invention of toughened glass is his exclusively, while I can only admit that he was the first to bring it into notice. My idea is that he made his invention known much too soon, before the whole subject had been exhaustively treated, otherwise he could never have laid so much stress upon the bath, when a little consideration would have shown that the same end might be reached by a variety of other means—such as the sudden cooling of the heated glass bodies. A greater or less degree of hardening is obtained by means of a powerful stream of air or steam, as in Pieper's process, or by burying the heated glass body in a cold pulverised mass, as well as by many other methods upon which competing processes are based. To M. de la Bastie belongs the great merit of having first worked out the theory of hardening glass and bringing it into a practical form. That he also invented it, however, one can scarcely say, since it has been long an accepted fact that, by sudden cooling of the fluid or highly-heated glass, glass drops, bottles, or other articles could be hardened, though this knowledge was not previously put to any practical use.

Now, with regard to the use of hardened sheet glass, Herr Siemens goes on to say:—"I do not for a moment imagine that it will ever supersede ordinary sheet glass, nor even that it will greatly diminish the demand for the latter. That is effectually prevented by the circumstance that toughened sheet glass cannot be cut in the ordinary way, as the diamond does not bite it. On the other hand, it may be ground and bored, made mat, or even well polished. Generally I prefer to undertake all these processes, with the exception of the polishing, either before or simultaneously with the hardening. In the production of patterns on the surface, and other operations which can be proceeded with at the same time as hardening, consists the great advantage of my process over others in respect of cost; therefore my efforts towards the perfection of my process are directed to these combinations. The resistance of the hardened glass to blows and pressure is, at least, ten times that of ordinary glass of the same thickness."

—*Allgemeine Chemiker Zeitung.*

(To be continued.)

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ÆSTHETICS OF PHOTOGRAPHIC PORTRAITURE.

In my published articles written for other journals some time since I endeavoured to demonstrate the fact that photography is justly entitled to rank as *one* of the fine arts, and that to excel in its practice requires genius quite as imperatively as excellence in painting or sculpture, architecture or music.

I suggested that without such genius an operator, however skilful in manipulating and in the merely mechanical accessories of his profession, could never be higher or other than a simple mechanic in our art; that is, however handsomely finished his pictures might be, they must ever want that life-likeness, that expression which enounces the individuality and personal identity of their originals.

Let me not, however, be understood as under rating great care and skill, coupled with the utmost attainable finish in the accessories above named. On the contrary, I have always strongly insisted on these, and in my own practice have ever given to them the strictest and most heedful attention. According to the familiar adage, a complete man should have "a sound mind in a sound body." Not less imperatively should a perfect photographic portrait combine a vivid expression of the sitter's soul with the utmost finish in the representation of his person.

I regret to say that numerous photographic artists are exceedingly defective in the mechanical appliances of the art, as well as in a point more important still. How, in fact, could it be otherwise when, from the urgent press of competition, the "cheap system" has intruded into this as well as into all other vocations, "sacred or profane?"

The "go ahead," hurry-scurry movement of our American life is bitterly hostile to high excellence here as well as everywhere else; for it is manifestly impossible to expend much care and time—even where ability and skill are not wanting—upon pictures which are vended for but a trifle more than the cost of materials used. The public, it should be frankly and boldly stated, are very culpable in this respect. Precisely so long as they prefer and insist upon having cheap wares, such cheap wares will be promptly furnished to their order; but their intrinsic value will invariably keep pace even with their cheapness. In order to procure a first-rate article, whatever its kind, a liberal pecuniary compensation must be paid, since, by a sad but inexorable necessity, artists are absolutely compelled to eat and drink, to wear and house, exactly like the rest of mankind. But I have said enough on this topic.

Let me remark, however, with the utmost emphasis, that, no matter how important may be the mechanical "getting-up" of a picture, there is one thing more important still—so important, indeed, that where it is lacking a portrait is virtually no portrait at all of a living creature, but, to say the very best of it, the bald representation of a lifeless being. In the "one thing" above mentioned I allude, of course, to what I have named "expression"—a term whose significance is so well known to my readers that they need no explanation of it from me. As I have just observed, to communicate this "expression"—whether produced by the pencil of the sun or by any other pencil—to a portrait, be it of the human face divine or be it of nature, genius is ever indispensable.

Does my reader ask what I mean by this term "genius?" My inevitable reply is that, however it may be with the wiser sort, I am wholly incapable of confining that subtle essence within the boundaries of a verbal definition. Its effects, however, I, like all others, can recognise at a single glance. So far as I can comprehend it, it would seem to be a faculty originally bestowed by the Creator—susceptible, indeed, of being developed, improved, and exalted immeasurably, but by no possibility to be acquired by one in whom its germs were not originally implanted. It acts in ways and towards issues which not even its favoured possessor can explain to others or even to himself. As simple matter of fact, however, he is qualified to perform by a seeming intuition, and on the instant, what those otherwise organised are unable to do by the most laborious and protracted efforts. It is the Divine agent, universally, in discoveries and inventions in all spheres. In the fine arts, however, its agency is absolutely indispensable; without its unmistakable presence they are not fine arts, but coarse arts. All, therefore, who are not vividly conscious of possessing this magic gift—be their general abilities and talents as ample and as various as they may—would act most wisely in eschewing all endeavours to master and practice these arts.

Not for a moment, however, would I counsel them to let such abilities and talents lie idle. Thus to act were treason to their own endowments, to say nothing of ingratitude to the munificent Giver of the same. But surely they may readily find innumerable vocations in this topsy-turvy world to which their peculiar powers are specially adapted, and by labouring in which they may acquire a grand and spotless fame for themselves, while they render essential service to their race. In the fine arts, however, they are most assuredly "not at home."

Now, to the photographic portrait poser—the art-student, possessing natural genius, who should have the sole control of the sitting department and management of the camera—I would offer some suggestions as to the means to be adopted to overcome the difficulty arising from the rapidity with which the sunbeam acts upon the plate.

The portrait painter (as I said in former articles) *may* have several sittings, each lasting for an hour or more, and thus have time to learn what is his sitter's most characteristic expression, or perhaps to call up that expression by his conversation and personal influence. The photographic artist has his sitter with him but a few minutes or, it may be, seconds, and even then the circumstances are such as not to be very favourable to producing in the sitter's mind the mood which will give his face and figure the best expression.

What can the sun-painter do to counterbalance these disadvantages? As I have stated more than once before, he must have genius as a *sine quâ non;* for this will not only spontaneously suggest various expedients to be used, but exerts upon those coming in contact with it a genial influence which can neither be analysed nor defined. But genius without cultivation, which supplies it with materials and implements, can accomplish little. Let us note, then, some of the means to be used in effecting the end to which I have above alluded.

In the first place, then, the ambitious and would-be successful photographic art poser should have his rooms and studio so arranged as to act favourably on his sitter's mind prior to, as well as during, the sitting. It will be understood, without my going into details, that he should fit up his rooms with artistic taste, having therein books, pictures, engravings, sculpture, &c., of a kind to attune the visitor's mind to the mood the photographer would wish to express in the portrait to be taken. In furnishing the apartments, &c., all the items of equipment should be regulated with a view to awakening in sitters the best and highest thoughts and feelings.

If I were speaking to commonplace, prosaic persons I might expect ridicule for these remarks. But the Editors and the readers generally of this Journal have, I trust, sufficient knowledge of human nature, or, in other words, philosophy, to know that we are very much in character what the circumstances about us have moulded us to be. The dark or the bright, the black or the white, around us cast their peculiar shadows upon our minds, whether we be permanently or temporarily under their influence. As the end we are supposed to be aiming at is to get from the sitter his best expression, and as all surrounding circumstances operate in one way or another to affect the mind, from whence the expression comes into the face and figure, let us make all he sees or comes in contact with in the heliographic studio tend to produce upon him the influence we desire. But I need not enlarge or go into details on this subject, since those who can understand it at all will understand it at once, and fill up the outlines here given from their own minds.

The previous preparation having been made, we now come to the time of sitting itself, and here, as I have repeatedly elsewhere intimated, a momentous task falls upon the artist who would get a portrait expressing the best and highest phase of his sitter's character. I might fill many pages with a detail of what experience has taught me in reference to the position the model (sitter) should be required to assume—the mode in which the light should fall upon his face and figure, so that blemishes may be alleviated and good points brought distinctly into view. In short, as to a thousand things respecting the configuration and locality of the sitting room, the windows through which the light comes, &c., &c.—all of which myriad particulars bear directly and essentially upon the fact whether a mere mechanical transcript or a mimic life reduplication of the sitter at his best is to be obtained—I may, perhaps, hereafter present the results of what a vigilant observation, prolonged through many years, has taught me in regard to these matters.

It seems to me strange that in all the numerous and, it must be said, excellent treatises on our art scarcely the slightest attention has been given to the subject which is by far more important than any other; that is, the means to be employed for getting the sitter's best and characteristic expression—his living, thinking, feeling self instead of a face and form, which makes us

> "Start, for soul is wanting there."

At present, however, I must restrict myself to a few words on a single point—the action of the artist upon the sitter at the moment of taking a portrait.

The photographic poser should possess certain conversational powers, together with manners and deportment enabling him to adapt himself to his sitter, whoever and whatever he may be, with such effect as to call up his best and most characteristic mood, or he should instantly quit the position at the camera for some very different implement.

And here I may remark that you will find, in looking over the biographies of all who have been distinguished in portrait painting, that they have uniformly been distinguished by their powers of conversation. To possess such powers demands, first, original genius, involving a ready sympathy with persons of all temperaments and characters; and, next, an assiduous cultivation of such genius—a cultivation which puts one in possession of all those myriad methods, both in the way of what is solid and graceful, whereby the hearer's mind is aroused and his heart set all aglow. Therefore, I would say that the photographic art poser, who would be truly such—who would do honour to his profession, and not do discredit to that bright orb who lends a luminous pencil for his work, exacting nothing in requital but a fitness for the profession assumed—must know at the outset that he possesses conversational capability, and then must cultivate such capability to the highest possible degree. I need not specify how he is to do this. His own spontaneity will prompt him. It is, however, obvious upon the surface that a fair acquaintance with books of the rarest quality is one important item in such culture.

But, more important still for him, as in truth for all men else, is the faculty for observation. Mingling with men of all degrees and qualities, the photographic artist learns how to approach and commune with all, and thus is able so to act upon his sitter, both by conversation and by mere personal presence, as to bring out the expression desired. My space, however, forbids my extending these remarks further. But to the Editors of this Journal, who have laboured so worthily to vindicate the dignity of our art, I can confidently appeal for sympathy with, and approbation of, these views. If they show that to be a first-class photographic poser requires genius, large culture, and high accomplishments, they show at the same time what you have so often declared—that the assumption of the heliographic poser's profession by persons possessing none of these acquirements is an impertinence and an outrage upon common propriety. MARCUS A. ROOT.

Philadelphia, U.S.A.

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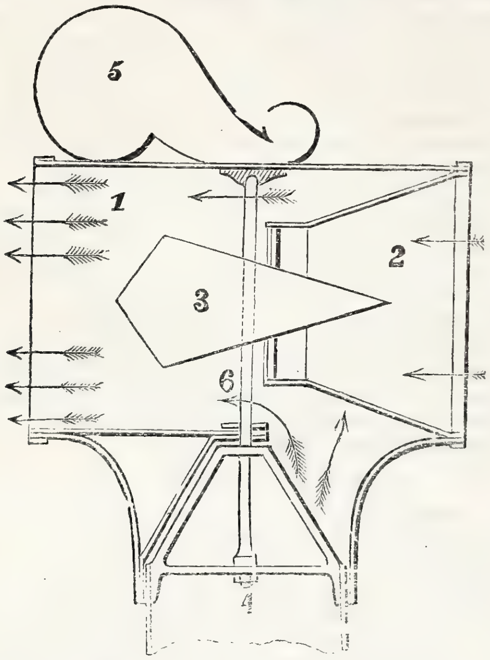
BOYLE'S PATENT SELF-ACTING AIR-PUMP VENTILATORS.

As it seems to be desired that further information should be given regarding the construction of Messrs. Boyle and Son's patent air-pump ventilators, I will here endeavour to supply the necessary information.

Spindle Ventilator.—The construction of this will readily be understood after a short study of the annexed diagram. It consists of a tube open at both ends (1), and inserted at one end is a conical tube (2) so as to contract the one end a little, and in the centre of the opening thus formed is placed a cone (3), leaving a good space all round it so as to admit a free current of air to pass through. This tube communicates with the main shaft, so that all heated and foul air is drawn up and has to pass through this tube before it finds an exit. On the top portion of the tube when fixed in position is placed a wind-vane (5), and it thus keeps the one end always towards the wind.



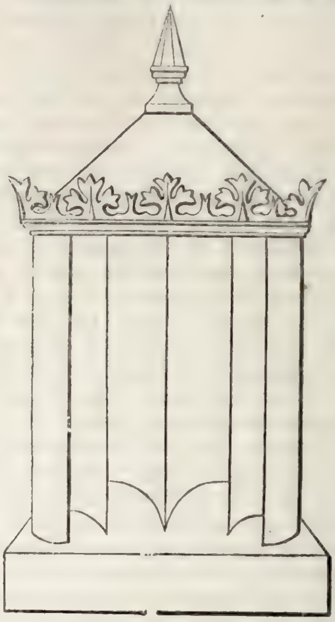
The whole apparatus is constructed on the scientific law that "the angle of incidence is equal to the angle of reflection." Now let us see how this acts here. The wind passes in, as seen by the direction of the arrows at 2. It is then split up by the cone, and continues in the same direction until it strikes and impinges on the sides of the tube, and at this point it is deflected in the same angle as the cone itself. In this way, being *thrown off* the sides of the tube, it passes easily away and does not get leave to remain about the other end of the tube and thus prevent an up draught. It is this that causes the suction action, and, forming a partial vacuum, new supplies of foul air is thus drawn up the shaft to supply the place of that which has just been drawn out. This action goes on so continuously that nothing but an up draught can possibly occur, and where a free current of air is passing through the tube a down draught is utterly impossible.

Even in the small model which I have beside me you can actually take a pair of bellows and blow in through the tube, hold a candle flame beneath the shaft, and you do not get the slightest flicker in the flame showing the presence of a down draught; and if you hold a small pellet of wadding where you held the flame you would constantly see the wadding drawn up into the ventilator.

It will be no use going into the mechanical arrangements of the spindle; any practical person will easily understand that for himself. These rods coming down, and forming a triangular space above the figure 4, are only supports to the ventilator, and do not interfere with the free passage of the foul air. Such a ventilator would be very suitable for public works of every description, byres, stables, &c.

So long as the action of the spindle is perfect this form of ventilator is all that could be desired, so far as mere ventilation is concerned; but, should it get out of order by the spindles getting a twist, so as to keep it from turning freely, and the wrong end of the tube was presented to the wind, then the result would be a tremendous down draught, and it is this that Messrs. Boyle take advantage of in admitting air into ships' holds, &c.

Fixed Ventilator.—This ventilator consists of four sections, each acting independently of the other. The annexed diagram will show the construction, and will also enable the reader to understand how the ventilation is brought about. If you were to take a transverse section of this you would find such an arrangement as this:—

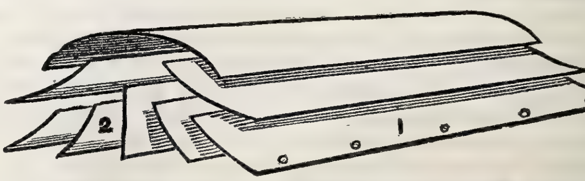


You have first of all the cross sections, and to each of the four arms on either side you have a plate with an extensive curve; then, between and separate from these, you have other plates placed at a certain angle. Outside of these you have separate and distinct plates curved externally, and you have outside of these again a set of plates curved internally. The diagram you have before you only shows one side; the other three are the same. Now, in whichever direction the wind is blowing through this apparatus, it must obey the laws of nature here as elsewhere. In passing in—say right in the centre of the opening—it strikes the externally-curved plates (seen in the diagram), and is deflected outwards, and will thus escape by the openings on the sides at right angles to this on the diagram. In so passing out it exhausts the two chambers in connection with these plates, and thus the partial vacuum being produced more heated air rushes up the shaft to supply the place of that which has been drawn off. It may seem a little complicated, but it is extremely simple, and when once examined easily understood.

For another example: suppose, now, that the wind was blowing right against the outside plates (internally curved), you may perhaps say that you have no ventilation then. Far from it; you have a most thorough ventilation, brought about in this way:—The wind would just continue the curve, and would then pass into the ventilator until it reached a counter force, and thus, coming in contact with the externally-curved plates, it would then be sent out at the other side with the foul air it had drawn with it. In this way it is quite impossible for a down draught to occur when there is a direct wind blowing against the apparatus. The same experiment as applied to the spindle when applied to the fixed ventilator gave the same satisfactory results, though perhaps the latter was rather more delicate in operation than the spindle. It took less wind to create an up draught than the spindle did.

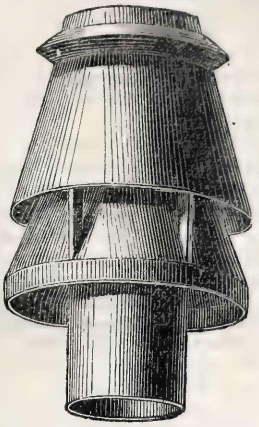
I certainly much prefer the fixed form. It is more satisfactory in results, it is neater than the spindle, having no movement it cannot get out of order, and it can be made to any pattern an architect likes to draw.

Ridge Ventilator.—This ventilator is a section of the fixed one, placed in a horizontal position on the ridge of a building. The external air, impinging on the louvre plates (1), is deflected upwards, and over the central radial plates (2), creating a powerful,

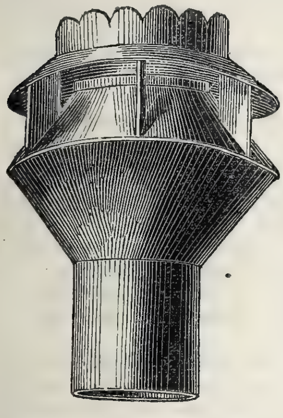


induced up draught, effectually carrying off steam, smoke, or foul air.

In order to prevent soot being blown down the chimney and into the apartment the apparatus I spoke of before ought to be applied I will here give a short description of it and a diagram. This apparatus is governed by the same law as the others. It is placed inside of an ordinary chimney cowl. It consists of a tube with openings in its sides (see diagram), and inserted at the top is a cone, so that, if a body of air be forced in at the false top, instead of passing down the vent it is split up by the cone, and deflected out at the openings in the sides. In its passage it also, to a certain extent, assists the up draught. It will be seen from this description that the apparatus is extremely simple and ingenious, and having no movement about it is not liable to get out of order or make a noise—the great fault of many chimney cowls. It is easily cleaned, the cone being made to lift out, leaving the vent quite open. It would prove most effective in the following situations, viz., where the chimney is in close proximity to, or surrounded by, higher buildings; where it is built against a gable or wall higher than its top; where it is overhung by hills or cliffs; and where there is any obstruction that will break the wind and cause a swirl. When a down draught is experienced it will most invariably be found that the wind is either blowing from or against the obstruction. Any vent or chimney could easily be fitted with one by sending the inside measurement of the can to the patentees, and I am sure little trouble would be experienced.



For a Smoky Chimney.—In the event of having a chimney which smokes much, owing to a want of draught in the vent, such a modification as here shown would be useful. Its construction will readily be noticed. It has no movement, therefore cannot get out of order; it is easily cleaned, being quite open at the top. It consists of a tube having several openings, the floors of which lie at a certain angle. These openings communicate with the vent proper, and any wind blowing against this apparatus strikes the floors of these openings (which are inclined upwards) and is thus forced up and out of the chimney, and, all pressure thus being removed from the top of the vent, an easy exit is made for the smoke. This form very materially assists the up draughts in sluggish vents.



I have tried to be as brief as possible, and yet to give a full explanation of the ventilators on which I addressed your Journal a few weeks ago. I only hope now that the information I have tried to give will be received and acted upon, and that we will have no more badly-ventilated studios and dark rooms.

John Laing, F.R.S.S.A.

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SCIENTIFIC JOTTINGS.

Protoxide of silver has been found to be one of a remarkable class of bodies, whose action is in opposition to all recognised theories. It is stated by MM. Trooste and Hauteville that it is capable of being produced at a temperature *above* that which decomposes it. Protochloride of platinum is placed by them in the same category.

Further particulars are now available of the action of light upon the Elœococca oil. Elœmargaric acid is extracted from it by treatment with an alcoholic solution of potash, which yields a well-crystallised salt, from which may be extracted the acid, melting at a temperature of 48°. Solutions of this substance in ether or bisulphide of carbon remain unchanged for an indefinite time if kept in the dark; but when exposed to light the acid is modified, so that when the solvent is removed by distillation in a current of hydrogen the residue melts at 71°. An alcoholic solution of the acid, when exposed to light, deposits fine crystals, which have the same composition as the original acid.

To the list of substances acted upon by light may be added santonine—an alcoholic solution of which was decomposed in direct sunlight with the production of an amorphous resinous mass, formic acid, and a special crystalline compound, a salt of photosantonic acid. This acid is likewise produced when a glacial acetic acid solution of santonine is exposed to light.

Iodide of potassium also has been proved to be acted upon by light. M. Battendier (*Journal Pharm. Chim.*) having stated that light quickly changes the iodide, turning it a yellow colour, and liberating iodine, M. Vidan stated that the intermediation of air is not at all necessary, as was supposed. M. Battendier therefore exposed solutions of iodide of potassium—first to sunlight and air, secondly to sunlight in a vacuum, and thirdly to air in the shade—and found that in the first case only did decomposition result, from which is to be gathered that air is necessary for the action to take place. He exposed other quantities of the solution to a variety of different actions with and without sunlight and air. When an atmosphere of carbonic acid surrounded it decomposition took place in a couple of hours, a decided yellow colour being produced in the solution. His final conclusions are that sunlight and the acids of the air, more especially the carbonic acid, are the principal causes of the change.

M. G. Planté has pointed out a new method of producing a light by the aid of electricity. On causing one of the poles of a secondary battery to touch the sides of a glass or porcelain vessel containing a saline solution, he was struck with the brilliant luminous effect produced. Pure silica, in the shape of crystals of hyaline quartz, were used with good results, greater battery power, however, being required with them than for glass. The luminous effects are put down to the incandescence of the silicium.

An interesting experiment, showing the composition of white light, is communicated to a scientific contemporary by Mr. W. Terrill. Using magic lanterns and coloured glasses he has been able, with two lanterns only—respectively containing cobalt blue and deep orange glass slides—to combine the lights into white by projecting the two coloured discs on to one spot. With a large number of lanterns he used a greater variety of colours. The effect of only partially overlapping the two discs is very striking, the pale blue and deep orange edges having a very extraordinary effect upon the mind.

M. Chevreul, at the Academy of Sciences, read, a little time since, a paper bearing upon this subject, or, more particularly, *On a Phenomenon of Insolation of the Eye.* He gave an account in his paper of two noblemen playing dice (a few days before St. Bartholomew's day) who twice saw blood spots upon them, which so alarmed them that they separated and gave up the play. M. Chevreul explains the occurrence as an effect of contrast of colour in sunlight, and gave some further experiments in illustration.

In giving extracts from a list of the telescopes in use throughout the globe, Mr. Rutherfurd's refractor, which is specially arranged for photography, is noted; it is stated to be of 10.5 Paris inches in diameter.

A paper has been presented to the Royal Society, by M. Bischof, describing a number of experiments made with his "spongy-iron filter." The results were very interesting, and showed the filter to possess a very important action over certain classes of impurities to be found in water.

We may note an observation of extreme interest to photographers made by Mr. W. Crookes at a meeting of the Physical Society. He stated that glass, though placed in a vacuum for weeks, would still retain upon its surface hygroscopic moisture, which could only be removed by heating. The usefulness of this knowledge in the preparation of glass plates may be found to be very great, as the number of pictures spoiled through being badly cleaned might be traced to some such cause.

A barometer is of untold value to a photographer, and something of the kind in a novel form is to be obtained at the present time in Paris. Artificial flowers, termed "barometers," are exhibited in a number of Parisian shops. They are coloured with a material composed of chloride of cobalt, and when exposed to sun or dry air the leaves become deep blue; when the air is full of moisture they become pinky, and all intermediate shades are readily perceived. Though this little toy possesses none of the characters of a barometer—being, in fact, merely a hygrometer—it may still be of use to those who study the probabilities of weather.

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Meetings of Societies.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The usual monthly meeting of this Association was held on Thursday evening, the 28th ult., at the Free Library, William Brown-street,—Mr. A. Tyrer, Vice-President, in the chair.

The minutes of the previous meeting were read and confirmed.

It was arranged to have an excursion to Bidston on Saturday, the 21st instant.

Mr. J. H. T. Ellerbeck exhibited a number of views taken in Prince's Park.

There being but few members present the meeting was of a conversational character.

It was decided to hold meetings on the last Thursdays in July and August, and the meeting was adjourned.

THE PHOTOGRAPHIC SECTION OF THE AMERICAN INSTITUTE.

At the May meeting of this Society, the President, Mr. H. J. Newton, occupied the chair.

The President introduced Mr. William Willis, Jun., of London, who exhibited a number of beautiful prints made by his platinum printing process.

Mr. Willis said that the object of the process was to produce photographic prints which should be permanent (or unalterable) under all atmospheric conditions. That object was attained by the use of salts of platinum in such a manner that the finished image should consist of that metal in the metallic state. Every chemist knew that metallic platinum was quite unaltered by any atmospheric influences, and was, moreover, unattacked by most chemical reagents; it, therefore, followed that prints produced in that metal were also permanent, and, to prove them so, they had been subjected to a great many severe oxidising and other tests, which had shown them to be impregnable. The process was founded on the following reaction:—He discovered that platinum was instantly thrown down from its salts in a metallic state by a solution of ferrous oxalate in neutral oxalate of potash. Ferrous oxalate was a lemon-yellow powder insoluble in water and in most other menstrua, its almost only solvent being the neutral oxalate of potash. Now it was well known that ferrous oxalate was produced by the action of light on ferric oxalate; if, then, a piece of paper were coated with the latter salt and exposed to light under a negative, they got a faint picture in which the parts affected by light consisted of ferrous oxalate. In his process the paper was coated with a salt of platinum in addition to ferric oxalate. If paper so coated were exposed to light under a negative, they should have, as before described, a picture in which the parts acted on had been changed from ferric to ferrous oxalate; but, in this case, the picture in ferrous oxalate was in contact with the salt of platinum, with which the paper was also coated. In that state no reduction took place in the platinum salt, because the ferrous oxalate in contact with it *was not in solution.* The moment, however, the faint picture was floated on a warm solution of the neutral oxalate of potash the ferrous oxalate was dissolved, and *in the instant of solution reduced the salt of platinum in contact with it and so formed the picture.* That was merely an outline of the general principle on which the process was founded; but to make a practical use of it required experience and familiarity with the different manipulations. In conclusion: he might mention that the exposure to light required by the process had been variously estimated at from one-fourth to one-sixth of that required in the ordinary silver printing process.

The President inquired if a picture that was over exposed could be remedied when developing.

Mr. Willis replied that it could not, as it was then fixed and could not be altered. He had not yet found any trouble from that cause, as very little practice would enable a person to judge of the correct time for exposure.

Professor C. A. Seeley remarked that the process of Mr. Willis was certainly deserving the attention of photographers.

The President said that the specimens exhibited were very beautiful, and from the description of the process the natural inference would be that they were permanent. He hoped that the process would be fairly tried by the photographic fraternity. He (the President) said that some time since he stated that from certain indications he was satisfied that emulsion could be made practicable for portraiture in the gallery; hence he had been experimenting in that direction for the last twelve months, and had so far succeeded that he felt justified in stating that he could make better negatives with less exposure and with greater certainty of results than could be made by the ordinary bath process. For gallery work he used the emulsion wet, simply washing the coated plates with water until the greasy lines disappeared. An ordinary glass bath-holder filled with water was very convenient for that purpose, for in it the plates might remain any length of time, suiting the convenience of the operator, without fear of injuring the working qualities of the emulsion. He (the President) then exhibited a number of portraits made with emulsion with an exposure of only one-third the time of his ordinary bath process. These pictures seemed to call forth not only surprise but universal commendation. They were, in fact, pronounced the best emulsion work ever exhibited before the Section, and quite equal to the capabilities of any process whatever.

After the examination of the pictures by the members,

The President stated that he had not yet published the formula by which they were made, but expected to do so at some future time. For the present he preferred to have the making of the emulsion under his own supervision and control—not because he wanted to make money by withholding it, but to protect himself from adverse criticism; for he had noticed that a published formula was rarely followed strictly by those who attempted to use it, and the failures thus resulting were unjustly attributed to the process. Mr. Laudi, of Columbia College, said in a letter written to him a few days ago—"Your wet emulsion plates I find develope readily with an exposure of one-half the time of bath plates, and with far better results. I do not, therefore, hesitate to state that your emulsion process is entirely practical, and it must and soon will be adopted by all who will give it a trial."

Professor Seeley said that he remembered that emulsion process some seventeen years ago, just as he was stepping out of photography. The emulsion then had an excess of silver, so it would not keep long. It was slow, and the collodion would deteriorate, though he remembered some very fair pictures were made with it. But the process was uncertain. The present method of the President he considered a perfect success. Looking at it from the standpoint of seventeen years ago he would say it was perfection, and, as far as his judgment went, he would be much surprised if it did not come into general use.

Mr. D. C. Chapman exhibited two negatives, and said he supposed they were all aware that his work was principally for astronomical purposes, and hence it required chemicals as sensitive as possible. In order to get the maximum amount of sensitiveness from wet iodide of silver plates he gave them a pre-exposure to light, which increased their sensitiveness about threefold. In making some experiments with emulsions, both dry and wet, he tried the pre-exposure to see if the same increase of sensitiveness could be obtained by that method, or, in other words, to see if a pre-exposure would affect the bromide of silver in the same manner that it did the iodide. He had brought with him two negatives which he had taken—one with the dry emulsion and the other with the wet. One half of each negative was exposed to light previous to being exposed in the camera, and he failed to detect any difference in the sides when being developed, as the negatives which he developed would show. He was therefore under the impression that the sensitiveness that could be obtained from an emulsion plate must be derived from the chemicals rather than by any pre-exposure.

Mr. T. C. Roche said that any good emulsion could be made to work more rapidly by first washing the coated plate thoroughly with water, and then flowing over it a solution of alkaline albumenate of silver before exposure. The solution was made by using the white of one egg, two ounces of water, and a few drops of aqua ammonia. To this was added enough of a thirty-grain solution of nitrate of silver to make the mixture milky. Then add ammonia again until the solution became clear. A few drops would be found quite sufficient to accomplish that. Before development the plate should be well washed, and a ten-grain solution of bromide of potassium flowed over; then wash and flow on the pyro. The picture would show up quickly. Now add a few drops of ammonia and bromide of potassium solution to the pyro., and complete the development.

Dr. Adolph Ott read a paper on *Photo-Stereotyping*, and exhibited a number of specimens of the plates and prints.

The Section was then adjourned.

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BOSTON PHOTOGRAPHIC ASSOCIATION.

The eighth annual meeting of this Association was held on Friday evening, February 2,—the President, Mr. French, in the chair.

The principal business was the election of officers for the ensuing year, the ballot resulting in the choice of the following gentlemen:—*President:* Frank Rowell.—*Vice-President:* A. N. Hardy.—*Secretary:* E. A. Ritz.—*Treasurer:* E. F. Smith.—*Executive Committee:* Messrs. J. W. Black, T. R. Burnham, and W. T. Bowers.

It being announced that Mr. G. H. Loomis, the first President of the Association, would deliver an address reviewing its eight years' transactions, that gentleman was introduced and received the interested attention of the members from the commencement to the conclusion, after which he received the usual compliment of a vote of thanks. The introductory portion of the address referred to the more immediate objects for which the Association was organised, chief among which were the resisting the reissue of the bromide patent, the repeal of the stamp act, and other burdensome and annoying troubles then existing among the fraternity. After reviewing the action of the New England photographers, and claiming for them the honour of being first at the front in all the aggressive movements for fair play and artists' rights, he gave them a condensed history of the work of the Association from its organisation till the present time, showing a very encouraging sum total of benefits received. He referred to the National Photographic Association as of Boston origin, and pleasantly spoke of the good time it enjoyed while holding its first convention and exhibition under the auspices of their young but vigorous local Society. Among the items of record as showing the scope of the Boston Association, Mr. Loomis selected as one worthy of comment the following:—"That members of this Society, *or others* wishing information upon any subject connected with photography, or wishing to present any question for discussion, manifest their wishes by transmitting them in writing to the Secretary." Here, remarked the speaker, we have a *school of free inquiry.* Those who are chemically confused and mechanically mystified have only to seek light from the more experienced and be set right by their explanations. "What!" exclaims A; "Are you going to let B know the secret of your improved work? Are you going to impart *for nothing* the new ideas you have studied out by experiment and practice? In other words, are you going to 'cast your pearls before swine?'" "Oh, yes!" responds B, "never mind; if it will help the weak, give him strength. Every good deed has, or ought to have and will eventually obtain, its due reward. Yes; I will out with the secret and it will be a secret no longer. Better work will come of it, and better work will help us all." And so this bit of moralising is introduced to show at what stage of the Society's deliberations it began to realise "how good a thing it was for brethren to dwell together in unity;" and here, continued the speaker, let me indulge in a few other thoughts. Most of us have witnessed the full and perfect freedom with which our leading photographers—those who have pioneered the art to its present high position—have given us their counsels, their suggestions, the benefits of their experiments, the results of their investigations, &c.; and to them something of a debt of gratitude is due for such gratuitous and friendly service, and we wish that the pleasant duty was afforded us in this retrospect to say that these generous instructions had met with that kind and degree of appreciation which evidently is their portion. Instead, however, it must be said that many who have received these benefits and been entrusted with the valuable hints given from time to time have used them in a very unwise, not to say dishonourable, competition, as exhibited in "cut under" prices and other artful dodges, not particularly calculated to dignify the profession or enrich its practitioners. If the legal right to pursue such a course is indisputable, the moral is equally questionable. In noting the item of record wherein a young member desires that "there should be more practical discussion upon more practical or profitable subjects," Mr. Loomis said—No doubt this is but one of many who have hungered and thirsted for more substantial benefit than the monthly sessions yield to attendants; and yet it must be remembered it is often easier to *demand* than *supply*. Added to the older membership are many younger persons full, no doubt, of the spirit of progress, but whose names do not often appear in the list of *talkers*. They are either excessively *timid* or *modest*—possibly both; very likely they are often weary of old and familiar voices, and want something new in the way of accompaniment and variations. I don't blame you, young gentlemen; but you must not forget to remember that there have been many moments of prolonged and painful silence which the presiding officer has invited you to *break* with your new and fresh thoughts. You have let these opportunities go by default, and have failed to come up to your high privileges and duties. Perhaps you were waiting to wear the official harness before showing your speed and powers. If so, the honours are within your reach; and we think these elder brothers, or such of them as are in possession of these distinctions, will surrender the same without a "grand joint commission" to vindicate their claims. While office is honourable, it is also irksome and frequently a heavy weight upon him who wears it. With an active and wide-awake membership; with zealous and efficient subordinates; with a healthy mixture of criticism and charity; and with an united and progressive spirit on the part of all, it is indeed pleasant to wear official distinction and discharge official responsibility. These helps lacking, the floor is better than the forum. In closing the review Mr. Loomis added—Though it has been my endeavour to preserve a general continuity in rehearsing your proceedings for the time named, I have necessarily omitted very many points as important, and more so, than those mentioned. Indeed, your records hardly indicate but in part the best work of your Association, for that portion of your time which has been spent in informal conversation and off-hand remarks has, without doubt, been productive of results more valuable than those born of set speeches in the observance of parliamentary tactics; and then the friendly competition which from time to time you have displayed in the exhibition of your work, and the charitable yet salutary criticism given to each other as you have examined the various specimens of your skill and taste, have done more than your monthly records show or that I have mentioned in this rapidly-written retrospect. And, now, what about the future? Does the "summing up" of benefits gained afford us the requisite encouragement to continued efforts? and, if so, what new and more efficient direction can we pursue to attain still more desirable results? It is evident that the protracted panic in the business world is being severely felt by most of us, and as a consequence but limited ambition is felt to do more than is absolutely required to meet ordinary demands upon our resources. There is, however, "light ahead," without doubt; and it is possible that the leisure forced upon us by dull times may prove something better in results than we expect "in the good time coming."

The officers elect are working men, and will spare no effort to advance the interests of the Association.

BERLIN PHOTOGRAPHIC SOCIETY.

A meeting of this Society was held on the 18th May,—Dr. Vogel occupying the chair. Three new members were admitted.

A written proposal, sent by Herr Claussen, of Meldorf, to the effect that, in addition to the albums already in the possession of the Society, one should be set apart for the reception of pictures illustrating the different stages of progress made by photography from its infancy to the present day, was then read and generally approved of, though some fears were expressed that there might be difficulties in the way of getting such an album properly filled.

Herr Prümm gave in a rather lengthy report of his further experiments with the euryscopes, and showed several plates taken with them.

Herr Boll showed an interesting example of the action of bronze upon photographs. He had pasted a print upon the back of a mount, upon which a name, medals, &c., were printed in bronze. In a short time the bronze had decomposed the picture and the design beneath was quite visible in the form of a white drawing on the silver print.

A discussion on the number of photographers in Germany followed, which developed into a discussion on picture-frames, in the course of which

Herr Prümm remarked that most of the frames made in Berlin were sent to England, and that those used in Berlin came from Cologne and Kiel. He also praised the taste and style in which the Munich carved frames were got up.

The President thought that as a nation the Germans were too poor and too economical to go in largely for expensive picture-frames.

Herr Hartmann had benefited largely by an exhibition of frames held some time ago by the Society, and proposed that another should be organised in the course of the coming winter.

There were several other speakers, and at the close of the discussion the meeting was adjourned.

RHEINISH WESTPHALIAN PHOTOGRAPHIC SOCIETY.

At two meetings of this Society, held respectively on the 20th April and the 4th May, no business was transacted that calls for special notice. On the 11th May the first anniversary of the foundation of the Society was celebrated by a banquet, and on the 25th May the annual general meeting was held, the President, Herr Baumann, occupying the chair. The President presented a report of the state of the Society, after which the office-bearers for the ensuing year were elected. In order to lighten the Secretary's labours it was resolved to purchase an autographic press. From the President's statement it appears that a year ago the Society started with twenty-two members on the roll; since that time twenty-three other names have been added and five have been withdrawn, leaving a total of forty members at present on the roll.

FRANKFORT-ON-MAINE PHOTOGRAPHIC SOCIETY.

A meeting of this Society was held on the 4th April,—Herr van Bosch presiding. After the admission of a new member,

Herr Walther intimated that he had been experimenting in the direction of the production of pictures having a texture like copperplates, and that he had already been pretty successful, in proof of which he showed a specimen picture. He remarked further that the graining could be omitted, or rather removed, from any part of the picture at pleasure if the part were previously prepared.

In order to bring matters more quickly to the point,

Herr Hartmann asked Herr Walther whether he intended making a secret of the mode of producing the pictures.

Herr Walther replied that as his experiments were not concluded he had not yet made up his mind.

From the subsequent discussion of the matter it appears that Herr Walther's method consists of giving the negative a protecting coat of varnish, then a new preparation, after which it is exposed upon shagreen paper, developed, and the places which should be free from granularity freed by an etching-needle from the granular film.

Herr Kurtz, of Wiesbaden, showed a number of portraits having a light background delicately shaded off. He explained that he used a single ordinary background painted sky-blue, and brought a little further forward towards the side of the head which is in shadow than towards that in the light. The effect was said to be brilliant.

The album which the Society intends to present to Dr. Hornig was laid upon the table, and examined along with several other articles; but no further business of interest was transacted, and the meeting was shortly after adjourned.

At a subsequent meeting of the same Society, held on the 18th April, Herr Geldmacher was in the chair. The only subject of interest discussed was Siemens' pressure-hardened glass, of which the Chairman exhibited several specimens, at the same time expressing a hope that this new variety of hardened glass might be useful for many photographic purposes, especially for solar cameras. [See page 317.] The meeting, having examined several other objects, was adjourned shortly afterwards.

Another meeting was held on Wednesday, the 2nd May, Herr Van Bosch, the President, being in the chair.

Letters were read from Herren Kurtz and Ott, of New York, and Herr Klaner showed plates having a texture similar to that of Kurtz's well-known pictures. The texture was produced by exposing the negative upon a piece of shagreen paper.

Dr. Stein, quoting from Dr. Magnus, said that one might often remark that portraits were unlike the individuals photographed in some way scarcely to be defined. The features might be a perfect likeness, but there was a something wanting to give a correct impression of the individual. He had come to the conclusion that the fault lay in the constrained position of the eyes, and in the practice of fixing them upon a given point—fixed only with reference to the general posture of the body, but with no regard to the individual's natural length of focus.

The **President** remarked that to catch the natural expression of a face was the most difficult task in photography. He thought that if the head were fixed in the desired position, and the sitter told to look in a certain direction, that ought to be sufficient, without directing him to look fixedly at a certain point.

Herr **Hartmann** agreed with the last speaker.

A discussion then ensued between the President and Herr Hetzer upon the importance of photographs as a foundation for the painter.

Dr. Stein called attention to Herr Albert's process for producing photographs in natural colours, which rested upon the principle of the three colours—blue, red, and yellow—only allowing rays of the same colour to pass through. Three views of an object were taken with the interposition respectively of a blue, a red, and a yellow glass. Thus a view was obtained produced only by the rays of one of those colours or its compounds. From these negatives lichtdruck plates were prepared, which might be rolled with the appropriate colours and printed from upon a single sheet of paper. He (Dr. Stein) thought the theory was very original, but feared there would be many obstacles to its being reduced to practice, not the least of which would be the difficulty of obtaining glass with a colour pure enough when subjected to spectral analysis. He thought that, instead of the coloured glass, vessels of colourless glass filled with as spectrally-pure coloured fluids as could be obtained might be used. Then, again, he thought it might be possible to make use of the colours of the sun's spectrum itself, since one could, by means of sulphuretted carbon prisms, project a pretty large spectrum against a wall. Thus the rays of the colour picture to be photographed could be taken with the pure spectral colour.

With these remarks the proceedings were brought to a conclusion.

Another meeting of the same Society was held on Wednesday, the 16th May,—Herr van Bosch taking the chair as usual.

Dr. **Schleussner** spoke favourably of Professor Husnik's new lithographic paper, and of a particular mixture of ink which was prepared specially for use with that paper and sold along with it.

The travelling album of the Cologne Photographic Society was then laid upon the table, along with some architectural and landscape views sent by Herr Creifelds, of Cologne, as a contribution to the album of the Frankfort Photographic Society.

Herr Geldmacher then showed a number of envelopes, for *carte-de-visite* photographs, made of sheet iron or tin painted in various colours. These envelopes were sent by Herr Herman Brandes, of Hamburg, and were intended to be used instead of the ordinary cardboard mount; but, though the novelties were very pretty, the general feeling of the meeting was in favour of the usual mount.

There was no other business of interest, and the meeting was shortly afterwards adjourned.

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EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale*, that being done at a small cost in our advertising pages. This portion of our columns is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

I will exchange for an 8 or 10 inch bellows camera and lens a tent 18 feet by 11 feet. The material cost £11.—Address, C. Mason, Dobwalls, Liskeard, Cornwall.

Wanted, a No. 6 globe lens and a cabinet roller. Will be given in exchange a Ross's 5 × 5 new rapid symmetrical, pair stereo. globe lenses, new camera, or difference adjusted.—Address, J. H. T. Ellerbeck, 68, Bold-street, Liverpool.

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ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

Registrations.—In our next.

T. J.—We have not yet heard of a probable purchaser, but may do so at no distant period.

J. F. R. B.—To ascertain the specific gravity of glass weigh it first in air, then in water, and note the difference.

F. York.—Thanks. The negatives are exceedingly instructive. With your permission we shall retain them for exhibition for a short time.

D. W.—The chief fault in your specimens arises from the lack of vigour. The manipulation seems good, while the posing is all that can be desired.

Ascalon.—The tissue has been received. We hope to be in a position to subject it to the necessary trial before the publication of our next number.

Andrew J. Graham (New York).—You will find in our Almanac for 1876 an article on the subject of producing a printing surface in relief. If you can gain access to some of the previous volumes of this Journal you would do well to consult them carefully. It is probable that, by calling upon Messrs. E. and H. T. Anthony and Co., those gentlemen would be able to afford you facilities for undertaking such examination.

J. E. Thornburn.—The lens which you name would not only be suitable for your purpose, but we should consider it an acquisition. We very often employ a lens of the kind and find that it covers a *much* larger field than that capable of being utilised by your camera.

Old Subscriber.—The terms upon which you may practice carbon printing, so as to ensure a mastery over the process, are now so very easy that you need no longer hesitate, even with your limited means, to commence at once. Address a note to the Autotype Company stating what you desire.

G. M. W.—If you try either the tannin or the coffee process you cannot fail to obtain such pictures as, we think, would suit your requirements. We cannot undertake to recommend special commercial preparations of collodion. If *we* were in your position we should use a collodion emulsion for preparing plates.

George Hercus.—Divide the bath in three equal portions. To the first add enough of a solution of cyanide of potassium to produce a very slight precipitate; to the second portion add a similar solution of carbonate of soda; while to the third nothing must be added, but it should be placed in the sun for several hours. Filter each of the solutions thus treated, and note carefully the behaviour of each when used for producing a negative.

Semper Verus.—There is no doubt that a body of black velvet or of plain india-rubber cloth would prove an effectual light-tight covering for a camera; but it is far from being either so elegant in appearance or so useful in practice as a nicely-constructed bellows body, which may, if preferred, be made of black calico. If, however, you give a preference to the plain velvet body see that you have a strong elastic band at each corner to keep the cover from collapsing.

Femora.—A little reflection will serve to convince you that, in obtaining photographs of the sun, it is almost immaterial whether the telescope itself be mounted equatorially and moved by clockwork or the telescope be fixed and the image of the sun formed in it by means of a plane reflector moved equatorially. Some physicists prefer the former system, and others the latter. It comes to very nearly the same thing in the end *minus* the small loss of light to be endured from the reflection when a mirror is employed. This, however, is so small as to necessitate an exposure of only one or two seconds more than would otherwise have had to be given.

M. D. (Ryde).—It is possible that a pyroxyline may have been used which has been so very soluble as to succumb to the alcohol with which the varnish is prepared; but we think that the dissolving of the film is more likely to be caused by the presence of methylic alcohol in the spirits of wine used as the solvent of the gums and resins in the varnish. Photographers should not forget that methylic alcohol (*i.e.*, wood naphtha) is an energetic solvent of pyroxyline; and as methylated spirits of wine, which is much employed in the preparation of varnishes, contains a large proportion of the naphtha, the dissolving of the collodion film by the application of varnish may in this way be accounted for.

Received.—A. Ford Smith. In our next.—Peculiar circumstances compel us this week to leave over several communications received till our next issue.

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A **Disputable Point.**—Teetotalism is becoming rampant in foolish interference. The Bishop of Carlisle recommends as a practical plan that habitual drunkards shall be photographed, and the portrait, with a black mark against the name, be sent round to all the public-houses by the magistrates with a prohibition against serving that man with drink! That is what they call "practical."—*Investors' Guardian.*

"**Street Life in London.**"—The sixth part (for July) of this illustrated serial, published by Messrs. Sampson Low, Marston, Son and Co., contains three of those photographs of scenes in everyday London street life which are so true to the industries of the great metropolis. These represent, respectively, *A Convict's Home*, *The Wall Worker*, and *Covent Garden Labourers*. As in previous numbers these pictures are printed by the permanent Woodburytype process, and are accompanied by appropriate typographical descriptive matter. Of the skill of Mr. J. Thomson in photographing scenes of this description we have spoken in former numbers.

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METEOROLOGICAL REPORT.

Observations taken at 406, Strand, by J. H. Steward, Optician.

For the Week ending July 4, 1877.

These Observations are Taken at 8.30 a.m.

June.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks
28	30·28	W	55	63	80	54	Hazy
29	30·25	W	58	68	85	58	Fine
30	30.22	NW	61	67	81	57	Hazy
July.							
2	30·01	NW	56	61	74	54	Cloudy
3	30·04	W	56	61	73	51	Cloudy
4	30·01	W	57	61	72	54	Cloudy

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 897. Vol. XXIV.—JULY 13, 1877.

INTENSIFICATION AFTER FIXING.

In our article on *How to Raise the Standard of Dry-Plate Results*, at page 301, we stated that the intensification of the negative subsequent to the operation of fixing frequently produced beneficial results, and it is our object in the present article to show how the best results are to be obtained.

In the first place, let us glance at the distinction between intensification *before* and *after* fixing. The first is done in the presence of the unremoved haloid, which, if not capable of further development properly so called, is at least liable to abnormal reduction by the action of the developer. This abnormal action may be insufficient to deserve the name of fog, and yet powerful enough to alter the character of the negative in a very marked degree by giving it an appearance of greater softness, or, more correctly speaking, perhaps, flatness. When the intensification is performed after fixing there is obviously no haloid of silver to be acted upon in this manner, and, therefore, no such softening effect ensues; hence it has been laid down as an axiom that intensification before fixing is conducive to softness, and after fixing to brilliancy and vigour. This is true enough as a general rule, but is by no means invariably the case, as a skilful operator will produce almost any desired effect by varying his mode of treatment.

It is of course open to us to employ, in addition to ordinary silver intensification, any of the methods which have been recently described in our columns; but as those methods are chiefly adapted to the production of very great density for line work, and our present remarks are confined to landscape work, we have to treat solely of the silver process and the precautions necessary in order to ensure success; for, as our readers will be aware, the conditions which exist before and after fixing are materially altered.

In the first place we have to consider the operation of fixing itself, or, rather, the agent employed, for this is a matter of some importance as affecting the after operations. Cyanide of potassium, so generally used by wet-plate operators, has special advantages which render it in their case preferable to hypo., such as its greater rapidity of action, its easy removal from the film, and the clean and brilliant appearance it gives to the negative. Against these must be set its poisonous character and its powerful solvent action upon the metallic image; these, however, need not enter into the calculation of the careful operator. When we turn to dry plates, which, as a rule, are prepared at the present with bromide of silver alone, we find that the action of hypo. is much more energetic than cyanide, and this, combined with its being non-poisonous, and from its exercising, comparatively speaking, no action upon the silver image, has led to its almost invariable employment by amateurs. The great and only objection to its use is met with when we desire to resort to intensification of the fixing, and consists in the difficulty with which it is washed out of the film after it has performed its function of removing the unaltered haloid. The slightest trace remaining results in the formation of a deposit in the transparent portions of the negative when the intensification is commenced—a deposit which is extremly difficult, if not impossible, of removal. Cyanide, being more easily removed, does not present this difficulty, and for this reason is under the circumstances to be preferred; but we have no doubt the majority of our readers who have become accustomed to the use of hypo. will elect to continue it in spite of the extra care necessary, and the following expedients will be found useful as safeguards against stains, and to be employed in conjunction with copious washing.

The perfect removal of the hypo. by washing is obviously the most direct way of preventing any abnormal deposit; but as it is impossible to be certain when the last trace has disappeared it is necessary to adopt some means of decomposing or rendering harmless any hypo. which may be retained in the film. A thorough washing becomes thereby none the less important, for the compounds formed, though much less hurtful than hypo. itself, are still liable to be present in large quantity to interfere with the success of the result; hence the desirablity of washing as thoroughly as possible, and using the after treatment as a safeguard only.

The first of these safeguards, and one which is most likely to be at hand, is a very weak solution of iodine—about two or three drops of the tincture in an ounce of water will be strong enough—poured on and off the film three or four times, and followed by a rinse under the tap. Either bromine or chlorine may be substituted for iodine; but the latter is more likely to be ready at hand. Another useful method, in which chlorine is the active agent, consists in heating together in a glass flask a teaspoonful of common salt and a few drops of nitric acid—say half a drachm—diluted with an equal quantity of water. Continue the heat for three or four minutes, and then dissolve the contents of the flask in a pint of water and preserve for use. A dilute solution of acetic acid may also be used—one part of acid in twenty of water. This acts by decomposing the hypo.; and if a very large quantity be present—as when the surface of the plate is merely rinsed after fixing—a thin veil is formed over the whole plate, consisting of finely-divided sulphur. If the washing have been properly performed, however, no such deposit is formed, nor need any danger be apprehended. Perhaps the best expedient of all is a weak solution of hypochlorite of lime, or bleaching powder, which is a powerful agent in eliminating hyposulphite. The solution should be strong enough to give a distinct odour of the bleaching powder; but no stronger, or otherwise it will act injuriously upon the image.

In employing any of the above solutions it must be borne in mind that any hypo. remaining to be removed is *in* the film and not upon the surface, or, even more probably, *between* the film and the glass; therefore the solution should be allowed a little time to penetrate the collodion, and not merely poured on and off. In the case of plates whose films are held by an edging of india-rubber an aperture should be made at one corner to allow the liquid contained between the film and the glass to escape, and the last traces may be driven out by directing a gentle stream of water upon the film, the plate being inclined in the direction of the aperture. That this course is necessary may be proved by placing to drain upon a piece of white blotting-paper a *well-washed* plate, either after development or after fixing, when it will be found that, in spite of the washing—which must have removed all traces of the solutions from the surface—a very distinct brown stain will be formed on the paper, caused by the liquid which oozes from between the film and the glass.

Having carefully removed the last trace of the fixing solution—which really forms the most important part of the operation—we proceed to intensify, first of all noting the character of the existing image and the course of treatment best suited to it. It may appear at first sight that in the absence of any developable haloid no variation of result could be obtained whatever the nature of the intensifier used, but such is far from being the case. It has been proved, over and over again, that the power of development remains in the collodion film after the removal not only of the unaltered haloid but of the image itself, and that the latter may be removed and redeveloped half-a-dozen times with no apparent diminution of power. It is, therefore, not surprising that the action of intensification may be regulated.

It is not possible to enter fully into the different varieties of image which present themselves for intensification. The proper treatment can only be arrived at by practice. But we may instance two very different types, namely, first, a flat image in which the lights are but little in advance of the half-tones in point of density; and, second, a harsh impression in which the lights possess considerable strength, while the half-shades are very feeble. We may premise that negatives to be treated after fixing must be already full of detail, as it is obviously impossible to add to what already exists.

In the first case given above we should commence with tolerably strong silver—say two or three drops of a twenty-grain solution to each drachm of intensifier—and continue adding it freely as the operation proceeded, the object being to lay the silver on as rapidly as possible, the lights under such circumstances being more readily affected than the feebler portions, and gaining a greater amount of density than the latter. In the second instance the object is to add the greater amount of density to the feeble portions, and in order to effect this we commence with a minimum quantity of silver, working slowly and carefully. This gives more of the effect of development, and the finer details appear to gain on the light. This gain is, perhaps, only apparent, the addition of a given quantity of silver in the feeble portions producing a greater visible as well as printing result than the same increase in the denser parts. At anyrate, by following this course much of the harshness is softened down and a presentable result produced, where otherwise it would have been unsatisfactory.

Finally: as regards the formula to be followed, there is little to be said. The ordinary pyro. and citric acid formula, so often given, is as good as any, the only alteration we would suggest being the substitution of acetic acid for a portion of the citric. Another matter worthy of attention is the manner in which the acid is used. Some use it in combination with the pyro., and others with the silver. Each plan has its advantages; but it would be well for the workers of dry plates to remember that in adopting the latter plan every drop of silver they add carries with it a corresponding proportion of acid, and that acid has a very injurious effect in causing the film to leave the plate on drying. A much larger quantity of acid is used under the latter plan than when it is in combination with the pyro., for which reason we think that for dry plates the pyro. and acid with plain silver will be found the safest. Some operators prefer to keep all three separate.

In conclusion: we may say that these remarks are penned more with the intention of reminding our readers of what appears in dry-plate quarters to be an almost forgotten process. Doubtless the increased facilities for obtaining density previous to fixing have rendered it almost unnecessary; but cases will arise where its use would be advantageous, and under existing circumstances the character of a negative is considered to be irrevocably formed previous to fixing—an idea which we wish to remove. It will be sufficient to remind our dry-plate readers that amongst wet-plate men Mr. Vernon Heath, Mr. G. W. Wilson, and others find intensification after fixing useful, and the two we mention are not the men to do *anything* without having a very good reason for it.

CARBON ENLARGMENTS AND THE SOLAR CAMERA.

THERE are two topics which at the present more than at any previous time possess the greatest possible interest for photographers. We refer to carbon printing and the production of enlargements. It is gratifying to find the public recognising so thoroughly the value of large portraits, whether untouched, worked up, or finished in oils; and equally satisfactory is it to find photographers encouraging the public demand that such enlargements shall be produced in carbon, as the most stable substance known to exist in connection with photography.

During the past week we took advantage of a visit paid to Mr. Viles, of Pendryl Hall, who has just completed the erection of a large solar camera constructed by Dr. Monckhoven, to ascertain by experiment whether, and to what extent, such instruments are capable of being made available in the everyday work of practical, if not professional, photographers.

We shall not at present attempt to publish any details of the camera itself, as we intend, on an early occasion, to give a descriptive article on the subject, illustrating it with engravings from photographs we have taken. It will be sufficient at present to state that the camera is fitted with a heliostat driven by clockwork, that the condenser is twenty inches in diameter, and that it is capable of enlarging any negative under ten inches in its greatest dimensions—that being the diameter of the dyalitic lens in the cone of rays—up to any dimensions that may be desired. The camera itself, is, therefore, stationary; and a house has been erected round it in which are fitted systems of shutters by which the sun's rays are enabled to fall upon the reflector from morning till evening.

Previous to our visit Mr. Viles had ascertained that the time required to print an enlargement from a *carte* negative upon a whole sheet of albumenised silvered paper was an hour; but, as this was considered too protracted an exposure, the propriety of utilising the greater sensitiveness of carbon paper was considered; and in response to a telegram a supply of ready-sensitised tissue was procured from the Autotype Company, and with it a series of experiments was immediately commenced, the degree of amplification being the enlargement of a *carte* negative up to about thirty inches. We commenced proceedings by cutting down the exposure of sixty minutes required for silver paper to one-fourth of that period, or fifteen minutes. A beautiful, soft, and very sharp carbon enlargement was obtained at the very first attempt.

Here, then, was an incalculable gain secured at once. First, a reduction of the exposure to the extent of seventy-five per cent.; secondly, a picture in a permanent material; and, thirdly, a picture *finished* as soon as it was developed upon the permanent support, for in carbon printing toning and fixing, followed by protracted washings, are unknown. As the afternoon wore on it was deemed expedient to increase the exposure to twenty minutes. When several negatives, including portraits and landscapes, had been projected in a magnified form upon sheets of carbon, the "happy thought" suggested itself to cut down the exposure from *twenty* minutes to *six* minutes, and defer the development of the special picture to be treated in this manner for twenty-four hours, in order to test in this tentative manner the value of the principle discovered about five years ago, namely, that in a carbon picture which has received only a *part* of its proper exposure under a negative the action thus started will go on increasing after its removal from the printing-frame, so that such portion of time, in darkness, *after* the exposure is an equivalent for a more protracted exposure in the light.

The result of this experiment was looked for with much interest and anxiety, because it was foreseen that in this lay the practical solution of the problem of solar camera printing in the very variable climate of Great Britain, where the presence of the sun can never be calculated upon for many minutes in succession.

When on the evening of the day succeeding that upon which the exposure was made we had got the tissue which had been exposed for *six* minutes mounted upon its permanent support and immersed in the hot water developing tray, the gratification of all present may be imagined when, after a few dashes of hot water over the smudgy, black surface of the embryotic picture, a charming, brilliant, fully-exposed portrait was brought to view. Not only was this picture not inferior to those which had received the longer exposures, but it was a little superior as regards exposure—so much so, that it is probable that five minutes might have proved to be a more suitable period of exposure in the camera than the six minutes it had received.

To compare the last carbon picture with silver prints: we have now arrived at a gain in exposure represented by six minutes as against one hour. But, as we shall now proceed to show, this does not at all represent the further reduction in the time of exposure that can be made.

It is well known that carbon tissues which are prepared and issued in the sensitised condition are necessarily much less sensitive to light than those which are bichromatised after preparation. It is a source of great convenience that pigmented paper can be obtained which requires no further treatment beyond exposure and development; but as there is usually no gain without some kind of loss, the convenience is purchased at the expense of a trifling loss of sensitiveness. This is of no consequence when the printing is effected through the medium of a printing-frame; but it is a very different matter when the direct beams of the sun are to be utilised in the printing of an enlargement. In this case, and in an uncertain climate, extreme sensitiveness is everything, especially to those who have to wait the temporary outcoming of the sun from the passing clouds which environ that luminary.

We have now, in pursuance of the subject to which this article is mainly devoted, to inquire into the precise amount of gain that would accrue in the abbreviation of exposures in a solar camera, if the photographer were to sensitise his own paper instead of purchasing it ready sensitised. We submit to correction by the Autotype Company if we are wrong in stating that permanence in the sensitised tissue is purchased at the expense of about one-half of the sensitiveness capable of being obtained under other conditions of preparation. From this it follows that, taking the six-minutes' case of exposure, when employing ready sensitised tissue a reduction of one half, or nearly so, may be obtained by making use of freshly-sensitised pigmented paper. By doing this the exposure is reduced to three minutes, or, to avoid over-stating the matter, say four minutes.

But, as we have observed, the printing of the proof, begun in the light, continues to go on if the exposed tissue be kept in darkness for some time. We have intimated how by this means the exposure was, in the course of twenty-four hours, reduced from sixteen to six minutes, and we have further indicated by what means this exposure might have been reduced to four minutes. We have now, at this stage, to ask the attention of the reader to a paper read at the last meeting of the Photographic Society of Great Britian by Mr. J. R. Sawyer, in which, directing attention to this topic, he makes, from practical experience, the following deeply-interesting announcement *apropos* of a very much under-exposed carbon picture:—"We shall find that day by day the action of the light will be *continued*—not an universal fogging and decomposition over the whole of the surface, but every gradation of light and shade preserving its proper balance, until at last a point is reached when the picture is as good as possible; that is to say, a photograph in pigmented tissue has been produced by allowing the light to act upon it for only one-sixth of the time supposed to be necessary, the remainder being due to the continuation of the light's action when the picture is no longer under its direct influence." The practical application of this to the present inquiry is as follows:—Assuming that by using recently-prepared tissue a direct solar camera can be obtained in twelve minutes as the requisite exposure for *immediate* development, an *equally well-exposed* picture can be obtained by means of an exposure of *two* minutes followed by a delay of two or three days between the exposure and the development of the print.

We need not pursue this investigation farther at present. From what we have said it will be seen that direct enlargements of the finest quality may be produced if the sun shine, without obstruction from clouds, for only two minutes at a time. But in the event of uninterrupted sunshine for several hours continuously, it is easy to calculate how large a quantity of carbon direct enlargements may be produced by an energetic photographer in a single day.

BURNISHERS AND BURNISHED PRINTS.

We have in various portfolios and packages sundry photographs on paper, executed in the earlier days of the art, which, still mounted on the first cardboards they were pasted upon, offer a remarkable contrast to others no better executed, and no differently toned—in fact, different in no way from one another excepting in the treatment they received after mounting. One set has been sent through a rolling press after mounting—"calendered," as it was then termed—and the other left as it dried, or at best had merely a slightly-warmed flat iron passed over it. That so simple a process as the mere exposure of a mounted print to pressure should have so much effect in improving its appearance is a little remarkable, and to one who had not had an opportunity of comparing prints rolled and unrolled would seem almost impossible; yet no one, we opine, who has seen prints before and after this simple process would hesitate to provide himself with one form or another of rolling press if his exchequer would in any way permit it. There are, of course, many amateurs whose production of pictures is of so limited an extent, that they do not care to go to the expense, and such workers make the best they can of the simple means at their command—usually the before-mentioned flat iron, which, deftly wielded, can yet be made to materially improve the appearance of a picture.

From the more simple original machines to the elaborate modern productions was but a series of easy steps, and soon we had every refinement of manufacture adapted to these now essential adjuncts to the studio—double-geared, burnished rollers, gun-metal bearings, silver-coated plates, nickelised rollers, &c. Such are but a few of the many improvements grafted upon the original press. Some years after their first introduction the idea was conceived of applying heat during the operation of rolling. Machines were constructed to allow of its continuous application by means of a Bunsen burner or a spirit lamp to the metal plate against which the prints are placed in the rolling. The plan gained many adherents at the time of its introduction; but, whether from the extra trouble involved or from other causes we cannot say, its use was pretty generally given up before the advent of the burnisher. The peculiarity in the effect given by the hot press was a special smoothness combined with a gloss like that produced by an extremely powerful cold press.

This surface polish seems to have been at one time almost universally aimed at, and many expedients were adopted to obtain it. We well remember seeing *carte* portraits, more than a dozen years ago, which possessed a very great amount of gloss, and had altogether an attractive appearance. The method employed, which was then looked upon as a secret dodge, will bear repeating even now; it was, in fact, the pioneer of the present system of burnishing. After the print was well dried it was taken to the fire and held before it as long as the fingers could bear till it got quite hot; it was then placed as quickly as possible, to avoid its cooling too rapidly, face down upon a piece of plate glass equally well "baked." Some hard, smooth object—such as a spoon or the handle of a bone toothbrush—was next vigorously and rapidly worked upon the back till the whole had been passed over several times in all directions, every now and then the print being held afresh to the fire. When these operations were concluded a little encaustic paste, such as has often been described in our pages, was well rubbed over with a piece of flannel.

We must not be understood as endorsing the advisability of producing a surface of extreme gloss for pictures. There are cases where it is admissible; but we have seen no effect more beautiful and artistic than the matt surface of the double transfer off a zinc plate. This is a question which has been often discussed; but our object now is to treat more especially of its mechanical aspect.

From the cold press to the hot press was an easy transition, but it was years before the next step was taken, namely, the invention and public sale of the now common burnisher, the action of this instrument being a combination of pressure with a drag of the surface of the picture to be burnished across a narrow strip of polished metal intended to be used hot. After their introduction in America they were brought over to England, and very soon became the rage, and, as usual, a host of imitations sprung up. We have a very distinct recollection of a picture being brought under our notice which possessed a very great polish, and had also, which appealed more to our taste, a remarkable richness and transparency in the shadows far superior to anything we had ever before seen, even among selected prints which had been treated with encaustic paste. A little inquiry soon put us in possession of the information that this picture had been sent through one of the American burnishers. This, however, did not at the time inform us how to account for the excessive richness of the blacks. Opportunities of experimenting with the burnisher soon occurring, however, we were not slow in finding out that all this depth of colour was due to the burnisher—not however, to its polishing powers, but to the heat it subjected the prints to. To those who have used the burnisher this fact will be familiar enough no doubt, but that it is far from being generally known we have every reason to believe.

Prints subjected to sufficient heat alter their colour considerably, the change being towards a warmer tone; thus a print of so cold and blue a tone that it would ordinarily be rejected is made by contact with a heated plate of a rich, deep brown, while prints, brown to commence with, are made almost red. And not only does this change in tone take place, but, at the same time, the whole colour of the print is made fuller and richer, more transparent, and that to a degree which would scarcely be credited. Many a worthless negative has, since the advent of burnishers, been made to do efficient duty, and many a rejected print brought out with an admirable richness of tone. Those who have discovered this, and been disinclined to use the burnisher because of the polish to which they object, have loosened the screws which govern the pressure till it has become almost *nil*, and so to some extent have gained their object, though the burnisher always increases the brightness of the surface to some extent. There are others, again, to whom the gloss is the only inducement to use the machine, and who, not caring to go to the trouble of heating the bar, use a greater pressure cold. We need not say that no alteration in tone or richness is then given, and nothing but the shining surface is imparted.

We wish to call our readers' attention to a very grave possible danger to the permanency of prints treated by heat. We had occasion, very recently, to refer to the parcel containing the first burnished print which had attracted us by the richness to which we have alluded to, when to our great surprise we found all its beauty had vanished. A sickly, brown-looking print remained without a trace of that juiciness of tone in the shadows which had so attracted us when we first saw it. Now burnishers have not been so long introduced into this country as to enable us to explain this fading under the average laws of fading. It may have been an accidentally-defective print originally, or the fading may be owing to the heat. We then hunted out a very beautiful ten by eight picture, taken by a well-known photographer little more than two years ago, which we thought, when it came into our possession, bore traces of the use of heat; it was faded to a still more ruinous degree.

It is for the purpose of calling attention to this matter that we pen this article. Our supply of burnished prints is very limited, so that we cannot form a judgment from them; we, therefore, advise every photographer carefully to examine any stores of old prints, burnished and unburnished, and compare sets executed about the same period, with the object of ascertaining whether any injury can be traced to the use of heat. The subject is very important. The gain in colour by the aid of heat is so great that it would be unfortunate if we should have to forego it on account of its inducing fading. The chemistry of the image not being sufficiently defined to enable any prediction to be made from its standpoint, if any of our readers can supply any facts which would help to settle the question it will be a gain to the whole body of photographers.

THE CAMERA IN THE GARDEN.

While it is probable that the chief employment of photography will always be in the production of pictorial results, it already is, and is destined in the future much more to be, a valuable handmaid to science, as well as an important aid in many of the manufacturing industries of the country. Valuable, however, as it is in those directions, there is yet another in which it is calculated to do good service, but in which it has hitherto been but little employed, or at least not utilised to anything like the extent to which its advantages entitle it. I mean as an educational agent. To the readers of this Journal, who are supposed to be more or less acquainted with photography in all its phases, the various ways in which it might play an important part in popular education will be obvious; but I mean to confine myself for the present to one branch in which, I think, there is a wide field hardly yet opened up, namely, the accurate representation of plants, flowers, and trees—not with a view to the production of pretty effects, but to the dissemination of correct knowledge.

The truth of the oft-repeated quotation, "knowledge is power," is applicable with much force to the knowledge which enables its possessor to recognise the multitude of wayside flowers, and name the various trees, which he meets during a holiday ramble, as it is a power of promoting a happiness altogether unknown to those who are strangers to that knowledge. It is, no doubt, true that to some the knowledge comes almost as if by instinct, especially as regards trees and the larger variety of common plants; but they would be very much surprised at the immense numbers of dwellers in cities to whom plants and trees are plants and trees and—nothing more.

It is also true that the pencil of the artist has not been neglectful of this department of pictorial representation, and that in some of the higher class of works on botany are to be found coloured plates of much beauty and no small degree of accuracy; but in most cases such works are too costly for popular use, while less pretentious books bear ample evidence of the draughtsman's desire to improve on nature's handiwork, and produce a pretty picture instead of an accurate representation.

But not only are there the wayside flowers, and those to be met with in our gardens, but the rarer and more delicate foreign varieties grown in the conservatories of the wealthy, and the botanic gardens of our larger cities, an acquaintance with which will be found a new source of pleasure to its possessor, but which it is almost impossible to acquire during the too infrequent and too hurried visits that most of us are permitted to make.

Now it is here that I think the camera might, and ought to, be made to do good service both to the people at large and to the photographer who may be enterprising enough to undertake the work. I am, of course, fully aware of the difficulties that attend the photographing of trees and plants in the open air, in consequence of the difficulty of getting an atmosphere sufficiently still for the purpose; but if our landscape photographers were fully alive to the value of these productions they would find many hours in which not a leaf was stirring, and would lay aside all other work in order to take advantage of such opportunities. With plants under glass, and in the sheltered nooks and corners of our botanic gardens, the difficulties referred to do not occur, and floral life may in most cases be photographed with as much ease and more satisfaction than an ordinary sitter in the studio. Nor will there, so far as my experience goes, be any difficulty in getting permission, and even required assistance, in carrying out the object. It may be taken as a rule that those in authority in such places are enthusiasts in their profession, and will ever be ready to give every facility for the work by removing plants to suitably-lighted situations, and making such arrangements as will best promote success in the undertaking.

Of course, under the most favourable circumstances, such work is not always free from difficulty, and, perhaps, nothing is more troublesome than to successfully overcome the relative degree of actinism in the light reflected from the variety of colours frequently existing on one plant, especially between the dark green of some of the leaves and the lighter colours of the flowers. But much may be done by judicious "dodges," and by remembering that, however bright the reds and many of their compounds appear, they act but feebly on the sensitive plate. It is always well to regard the green light reflected from a leaf as thoroughly non-actinic, and remember that it is to the white light reflected at the same time from its surface we are alone indebted for whatever impression may be made. In consequence of this, a leaf, of a very dark green, but with a smooth shining surface, will have more effect on the sensitive film than one much lighter in colour, but wanting in gloss. Bearing this fact in mind the photographer will easily see the advantage of, in some cases, supplying the leaves with a liberal allowance of water, and so materially increasing their power of reflecting white light. Much also may be done by the use of screens of tinted glass placed either in front of the lens or of the plate. But, although I have for some time been experimenting in this direction, I am not in a position to dogmatise on the subject, yet I strongly recommend those who do much in this way, or in the copying of pictures, to attach a suitable carrier to the front of the lens, and carefully watch the effect of photographing through various shades of red, green, and violet, and of their compounds.

But, whatever optical arrangements and method of managing the light may be adopted, one thing must not be forgotten, viz., that the plant itself should not be touched, but photographed in all the beauty of its irregularity. What is wanted, especially, is a true representation of its natural form, and not such an abortion as is too often seen of a fuschia trained to an upright stick with numerous cross pieces at regular distances. Such training is all very well for a plum tree against a garden wall, but is utterly detestable in objects where Nature, when left to herself, evolves the highest and most perfect beauty.

"Would such work pay?" is, I know, a question that will not unnaturally occur to the practical mind. I think it would. Never before was the world more fully alive to the value of education, and at no previous time has the word "education" had a wider signification. We are not now content with the three r's and their concomitants, but must know something of almost everything; and there can be little doubt that a series of card pictures—each containing a true transcript of some plant or tree, with, underneath, its botanical as well as its common name—would be gladly purchased and highly appreciated both by those who educate themselves and those who have charge of the education of others. Then, as mere things of beauty, the general public would highly esteem such pictures; for all who have had much experience in connection with lantern exhibitions know that while the finest portrait, unless it be that of some well-known face, or the most perfect landscape, may be projected on the screen and elicit only slight applause, while the image of even a single fern, a foxglove, or some familiar flower, always, in theatrical parlance, "brings down the house."

Again: we have all experienced the value of a well-stocked album in helping to pass pleasantly an after-dinner hour; but of even the best collection of portraits, especially when we have but little interest in the originals, we soon become tired. Substitute, however, for the portraits a series of such pictures as I here recommend, and the truth of the maxim that "a thing of beauty is a joy for ever" would, I think, be abundantly manifested, and especially would it be so with the younger members of a family, who would take a delight in recognising in their wayside walks such plants and trees as the album had made them familiar with.

Taking it all in all, I think there is in "the camera in the garden," an almost untrodden path, where many who are doing but little now might do good both to the world and to themselves.

John Nicol, Ph.D.

OYSTER-SHELL MARKINGS.

From the time that the negative silver bath and collodion were first introduced lamentations have been rife on oyster-shell markings in the negatives, and these regrets are still to be heard.

These markings consist of small figures of different sizes, from that of a bean down to that of a little pinhead, appearing in the film under the development. They are altogether egg-shaped, the stubby ends of them turned downwards on the picture, the pointed ends subsequently directed upwards, diminishing in form and appearance. Within the said drawing the figure is repeated one or more times, one in the other, so that the whole of the little figure in its shading resembles an oyster shell, after which it is called.

In all probability every photographer knows these small, unpleasant visitants too well. He knows that they ever appear in flocks, and always in the same direction, downwards on the plate, the largest at the head of them altogether seeming to be in a great hurry, with their stubbied ends foremost, like comets which, in their speed, have lost their tails and only saved the stumps of them. Their quite equal shape, their quaint egg-shaped drawing, their appearance in flocks, always in the very same direction, always equal in every studio, in every country—all this seems a wonder!

Were we to collate and issue in print all that has been written on these so-called "oyster-shell markings"—these foes of our negatives—it would amount to a big book. In spite of all that—in spite of the multifarious researches, investigations, and advice offered by able chemists—a specific against the evil has hitherto not been discovered. It keeps on defying every remedy, and during hot weather irritating many photographers.

Of course the source of these annoyances was looked for in the chemical condition of the silver bath. However, when I resolved to immediately get rid of these tormentors, and prepared a new bath, it would happen that they again appeared on the very first plate, and the patience of a man could scarcely be put to a more severe test than that of the photographer under such circumstances.

But at last the cause of these markings dawned upon me. I was, as are all photographers, myself the cause, and the chemicals, the temperature, &c., had nothing to do with it. The "markings" are a consequence of too great *hurry*, and of course they appear when the photographer has a heavy press of business. By such an event he is much more hurried with every manipulation than at more quiet times. He immerses the dipper with the plate too quickly into the bath, and this, under the violent plunging of the negative, sends up a spout by which some drops of the liquid, greater or smaller, place themselves on the plate before the latter can reach the bath. These sprinklings before the immersion form the markings, particularly when the plate has grown a little too dry, against which we have in vain been at war in the whole period of the application of silver baths.

From the time of my having made this discovery the oyster-shell markings have not paid me a visit, till I now and then again forget to immerse the plate cautiously in my bath. However, I have now managed to keep free from them, and so can every one of my fellow-artists if he always bear in mind this cause of their production.

Peter Chr. Koch.

BROMISED COLLODION PROCESS—DRY AND WET.[*]

Tannin.

Water	3½ ounces.
Tannin	60 grains.
Gallic acid	4 ,,

In order to make this solution clear it is necessary to add a few drops of a hot solution of gelatine (about ten per cent.), which precipitates all the deleterious substances. It must then be filtered; after which add a few drops of alcohol containing a trace of *(phénique)* acid. This solution may be applied on the sensitive film, after it has been well washed, in a few minutes from the time of application. It should again be washed and left to dry in a current of air. Washing the glass after the application confers greater rapidity, especially in connection with bromide films, the sensitiveness of which are increased in a manner deserving notice.

Although it may seem useless, it is nevertheless of importance to wash the film before submitting it to the action of the developer. The results given by the above solution are excellent, and the plates keep a long time, with great sensitiveness, in a moderate temperature.

Tobacco and Gum.

Tobacco is a preservative seldom used, but the results are good—in fact, it compares favourably with many others. I prepare the tobacco solution in the following way:—

1.	Water	2½ ounces.
	Ordinary tobacco	80 grains.
2.	Water	5 drachms.
	Gum arabic	30 grains.

I wash the tobacco quickly in cold water in order to remove any materials which might be hurtful, and, having squeezed it, I put it in a dish with the water and hold it over the flame of a spirit lamp, and in a short time filter, but not before it is quite cold. I then add solution No. 2 and again filter. A small pinch of powdered camphor will improve its keeping properties; but this must be done with care, as, if too much be added, it is rather injurious.

The plate having been washed, I coat it several times with this solution. I again wash, and then leave it to dry. This last washing is important; for if any of the tobacco solution be left on the plate the sensitiveness is considerably diminished. There is no necessity for washing the plate before developing.

The results given by this solution are good, the details being soft and harmonious.

Tobacco and Glucose.

Water	3½ ounces.
Malaga raisins (stoned)	2½ drachms.
Tobacco (washed)	1¼ drachm.

After boiling for a short time leave the solution to cool, and filter. It is used in the same manner as the tobacco and gum, and the results are almost the same, only the preparation will not keep so long.

Wine and Tobacco.

Natural red wine (good quality)	3½ ounces.
Tobacco (washed)	1¼ drachm.
With or without camphor	1 grain.

This is boiled for a short time and allowed to cool, after which it is filtered. The film having been washed this solution is applied two or three times, then washed again and allowed to dry. The results are satisfactory.

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[*] Continued from page 316.

Salicine and Gallic Acid.

Alcohol	3 drachms.
Salicine	16 grains.
Gallic acid	4 „

After this has dissolved add—

Water	3 drachms.

Apply this to the film in the usual manner, then wash and leave to dry.

This preserves the sensitiveness, and the solution will also keep for a long time. Washing the film before developing is not imperative.

Salicine, Gallic Acid, and Lead.

Water	3½ ounces.
Alcoholic solution of gallic acid	7 minims.
„ „ salicine	3 „
Acetate of lead dissolved in acetic acid	3 „

Leave for some time and then filter.

This preservative is more easily understood when put under the following classification:—

No. 1.	Alcohol	7 drachms.
	Gallic acid	22 grains.
	Salicine	15 „
No. 2.	Acetic acid	7 drachms.
	Acetate of lead	*Quant. suff.*

Preservative:—

Water	3½ ounces.
No. 1	1½ drachm.
No. 2	1½ „

Apply several times on the film and allow to dry. It is necessary to immerse the plate in water before developing.

The results are good, especially with bromide films, in which case the sensitiveness is greatly augmented. I can recommend this formula for emulsion and collodio-bromide plates.

Tannin, Gallic Acid, and Cinchonine.

Water	3 ounces.
Alcohol	6 drachms.
Tannin	1 drachm.
Cinchonine	7 grains.
Gallic acid	1 grain.

Dissolve the tannin in water, clarify by a few drops of gelatine, and then filter. Add the alcohol containing in solution the chinchonine and gallic acid; it must then again be filtered. The film should first of all be washed; after which it is submitted to the application of the above-mentioned solutions and left to dry.

The results of this are good under all conditions.

—*Le Moniteur de la Photographie.* Ernest Boivin.

NOTES ON PASSING EVENTS.*

By a Peripatetic Photographer.

It is all very well for people to apply their handkerchiefs to heated brows and talk about the inconvenience that poor photographers experience when, with the thermometer between 70° and 80°, they have to collodionise a plate and to expose and develope it. This is nothing—absolutely nothing—compared with the inconvenience experienced by the poor fellow who, having carbon printing on the brain, essays the sensitising of a dozen sheets or so during the month of July. Everyone recognises the fatal facility possessed by good tissue for dissolving in water "with the chill off;" and as this is the characteristic of all kinds of water subjected to the broiling atmosphere peculiar to summer, it follows that carbon printing would be "bottled up" for the season if scientific skill were not imported into the fight against nature. Granted that by putting a few bits of ice into the bichromate bath *its* temperature may be kept at a degree sufficiently low to prevent the pigmented gelatine from dissolving off and making a mess of the sensitising solution, what is to become of the sensitised tissue after it has been suspended to dry? If the room in which this drying is to take place be at all warm, the tissue will not have remained suspended for half-an-hour before sundry vertical streaks down its surface indicate that it is beginning to dissolve—an indication that is but too fatally confirmed when, in the course of an hour or two, a black, pitch-looking streak on the floor below each sheet discloses the fact that the solution of the pigmented gelatine has already taken place to a considerable extent. Who will provide a practical remedy for this evil? This is all that militates against the effective carrying out of the carbon process in hot climates, such as that of America. Methinks that a drying-box or chamber might be constructed with double walls—wood outside and tin inside—the space between both walls to be filled with lime or any other non-conducting substance, into which might be brought a current of air supplied from below, the pipe conveying this current having been brought, in a coiled-up fashion, through a vessel containing a mixture of ice and salt. This would surely be quite practicable, and I do not believe anyone would find fault with it on the score of expense, as the drying current would only have to be cooled from ten to twenty degrees below the hottest temperature we usually experience in summer. The principle of producing cold by evaporation might also be brought into action in providing a cheap and effective refrigerator which would be suitable for the carbon printer, who, owing to hot weather, may find himself *in extremis.*

Mr. Protheroe is quite right; good conversational powers *are* indispensable to a successful operator. But there are some operators who are gifted with *great* conversational powers, not kept in check by culture and education, which have a tendency to do anything rather than conduce to a pleasing expression. What expression save that of disgust could be produced in the animated countenance of the witty lady, Clare Vere de Vere, when, after listening for some time to the interminable chatter of a garrulous and illiterate photographer, he winds up by telling her to "'old her 'ed a leetle 'igher, helevate her 'ighbrows and hopen her mouth, so as to put hon a smile?"

With reference to the method of obtaining stereoscopic relief in microphotographs which has been described in an editorial article in this Journal, I may here allude to one which in my hands has proved quite successful. It consists in placing a rotating cap over the anterior lens of the objective that is to be employed, this cap having an aperture at one side of the centre, or, what comes to the same thing, an aperture with a mask that covers precisely one-half of the front lens. A photograph is taken with the aperture in this cap first on one side, a second picture being taken after the cap has been subjected to a half revolution. The resulting pair of pictures will show stereoscopic relief. When it is borne in mind that the act of causing the light to fall upon a thick microscopic object will produce a change in the visual relation of one portion to another, it is rather surprising that this method of obtaining micro-stereographs is not more resorted to; indeed, I do not at this moment recollect that attention has been directed to it in this connection. But that excellent stereoscopic pictures may in this manner be obtained I have the best of all evidence in pictures in my possession that were produced with the requisite degree of dissimilarity by the mere act of shifting the position of the lamp by which the objects were illuminated. *Wanted*—a treatise on microphotography, with special reference to the production of enlarged images in stereoscopic relief. Who will encounter the task and become the producer of such a treatise?

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UPON THE INTENSIFICATION BY LEAD PROCESS.

About a year ago Dr. J. M. Eder published in the *Photographische Correspondenz* a series of experiments carried out by him along with Herr von Tóth, and intended to establish the theory previously described by him under the name of methods of intensification with lead. Dr. Eder then found that the action of metallic silver upon ferrocyanide of potassium proceeded quite smoothly in the way given in his formula, and confirmed this conclusion by quantitive analysis. Supported by this result Dr. Eder inferred that the silver would act similarly in the presence of both nitrate of lead and ferrocyanide of potassium—that is to say, that argentic ferrocyanide and plumbic ferrocyanide would be formed. In support of this Dr. Eder undertook no quantitive experiments, but assumed that the reaction was expressed by the following formulæ:—

I. $2\ K_6\ Fe_2\ Cy_{12} + 4\ Ag = 3\ K_4\ Fe\ Cy_6 + Ag_4\ Fe\ Cy_6$.

II. $3\ K_4\ Fe\ Cy_6 + 6\ Pb\ (NO_3)_2 = 3\ Pb_2\ Fe\ Cy_6 + 12\ K\ NO_3$.

Now, from certain experiments I have made I believe myself justified in saying that these equations are not quite correct. At the same time I shall have some remarks to make upon lead intensification in general.

In spite of its being almost self-evident, owing to the well-known sensitiveness to light of ferricyanide of potassium, I shall remark that the process of intensification by lead should only be carried on in the dark room, where the progress of the reaction may be ascertained, from time to time, by diffused daylight. If this precaution be not taken, then, in consequence of the reduction of the ferricyanide of potassium, white, turbid, ferrocyanide of lead will be thrown off—an appearance which often causes a fatal veiling of the negative. Everyone who intensifies with lead will occasionally be surprised to find that on putting the silver negative into the bath the white colour so often mentioned does not appear, but instead of it a decided orange. In the same way one finds that by the action of the finest silver foil upon a solution of ferricyanide of lead no white, but a dense orange-yellow precipitate is produced. Then, again: if one pours water containing only a very small quantity of hyposulphite of soda over a plate intensified with lead, a yellow solution is obtained, and the plate immediately becomes white. The orange-coloured deposit which occurs in the solutions of ferricyanide of lead is reduced by the addition of excess of silver foil;* and in the same way the orange-yellow plate is completely deprived of colour if laid in water in which finely-powdered zinc is held in suspension. This is also a reducing process, and the ferricyanide of silver formed is reduced. In my experiments I made use of red prussiate of potass repeatedly crystallised in the dark, and white nitrate of lead. I must also remark that the experiments were made so that silver was never present in excess.

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* Continued from page 317.

I put 0·1547 grammes of the finest silver foil into a solution of plumbic nitrate and ferricyanide of potassium, prepared according to Dr. Eder's directions, and in a short time obtained an orange-yellow, rather dense precipitate, which, when washed, dried, and weighed, gave 1·178 grammes. The solution was free from silver. The colour of the precipitate, its susceptibility of reduction by zinc and hyposulphite of soda, showed the presence of ferricyanide of silver, and I believe the equation should be constructed as follows:—

I. $4\,\mathrm{FeII\,Cy_4\,K_6} + 6\,\mathrm{Ag} = 6\,(\mathrm{Fe\,Cy_2\,K_4}) + \mathrm{FeII\,Cy_4\,Ag_6}$.

II. $6\,(\mathrm{Fe\,Cy_2\,K_4}) + 12\,\mathrm{Pb\,(NO_3)_2} = 6\,(\mathrm{Fe\,Cy_2\,Pb_2}) + 24\,\mathrm{K\,NO_3}$;

that is to say, a *ferricyanide*, and not a *ferrocyanide*, of silver compound is formed, so that of necessity the proportions in the quantative analysis must be differently arranged from what they were in Dr. Eder's equations. According to this, one gramme of silver should produce 5·84 grammes of precipitate; according to that, 7·46 grammes. That makes by computation from 0·1547 of a gramme, in the first case, 0·903 of a gramme, and in the second 1·1539 of a gramme. My experiment gave 1·1780 of a gramme, the small difference of twenty-four milligrammes being probably attributable to a secondary process; for I found that the dried precipitate did not dissolve completely, even after being treated for hours with a concentrated solution of hyposulphite of soda, but that there remained a small quantity of a greenish-yellow deposit containing lead.

When the silver alone acts upon the ferricyanide of potassium only white ferrocyanide of silver is produced, and so far Dr. Eder's observation is correct; but when the nitrate of lead comes into play the case is altered, and the solution behaves like a solution of ferricyanide of lead.

In conclusion: I may remark that I have not succeeded in intensifying negatives taken by the dry process with lead. It is very remarkable that the precipitate thus formed may be completely rinsed off the plate in the form of a sandy powder—a phenomenon which I have explained to myself by supposing that in dry plates the silver deposit lies only upon the upper surface of the film, while in wet plates it is retained in its place by the porous nature of the collodion film.

V. Wartha, *Prof.*

—Photographische Correspondenz.

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ÆSTHETICS OF PHOTOGRAPHIC PORTRAITURE.†

A progressive and successful artist in any department of art will usually be found pursuing his work with all the enthusiasm of his soul, and with a strong desire to equal, then to excel, in all branches of his art; and I might add, too, with a modest wish for fame, if not for profit, while striving to catch and secure, as best he can, the beauties of nature, both in landscape and portraitive art, as he finds and sees them favourably lighted up. It is this glowing enthusiasm, this ambitious effort, directed by genius and tact, which will stamp his productions generally with superior excellence, so much above, in quality and value, those produced by the mere plodding, unthinking, machine-like artist.

These self-evident truths were very vividly forced upon the mind of the writer while carefully examining and comparing the various qualities of the multitude of photographic productions placed on exhibition in our International Centennial World's Fair, 1876.

The photographic art-student, after having carefully studied and acquired a thorough knowledge of the effect and use of light and shade, prior to the handling of the camera will generally find that a preliminary work must be done by the artist-poser, and for the successful execution of this work genius is indispensable. And the sitter, before a transcript of him is taken, should be put into a mood which shall make his face diaphanous with the expression of his highest and best—that is, his genuine, essential self. A portrait, in my opinion, is next to worthless if the pictured face does not show the soul of the original—that individuality which distinguishes him from all others. The true artist must detect and "fix" the expression, marking the personality of the subject, or he shows himself, virtually, unequal to his duty. He, then, who is not clearly conscious of being artistically and intellectually endowed, had better adopt without delay some other vocation wherein such powers as he really does possess may be usefully and reputably employed. Art is certainly not his sphere.

But how can the poser detect and call up this expression during the brief period in which he has to exercise his skill? To this end he must exert his best conversational powers while bringing to bear on his subject (the sitter) all his highest artistic ability. Doubtless with some models several sittings must be needful for attaining this result, as the artist may wish to study his subject while in different moods and acted on by various influences. The artist-painter, by the several sittings accorded him, may scrutinise his subject in many of his various moods, mental and physical, and thus ascertain his sitter's individuality, which he then transfers to the canvas with natural force. Herein lay the great secret of the wonderful success of such eminent artists as Sir Joshua Reynolds and Sir Thomas Lawrence in England, and our Gilbert Stuart, Henry Innman, Elliott, &c.—all men possessing veritable genius, affable and polished manners, easy and fluent conversational powers, and being, consequently, great masters of expression in portraiture.

Contrariwise, the photographer may have his ante-room thronged with visitors of numerous diversities of intelligence, character, and social position, all waiting their turn—often impatiently, and not always silently. To each he can give but a few hurried moments. Within such brief period he must (if at all) detect and represent the individuality of each. If, then, despite these embarrassments and hindrances, the photographic poser can, for the most part, produce pictures exhibiting this lifelike expression, may we not say that he possesses more intuitive genius than even the painter of the same grade?

In every photographic establishment where it is desired to found a successful reputation I would not only suggest, but urge, the absolute necessity of having specially employed, to direct the operations of the camera, none but the ablest, the most intelligent, and accomplished man as the poser—a gentleman possessing great tact and high social qualities, able to receive and act potently on the mind of the model while sitting, with the view of securing the most favourable and appropriate expression. Genial, habitual good nature is another important requisite to a professional poser. A bright, sunshiny face is a positive pleasure to all beholders. It enhances the sitter's cheerfulness if already in good spirits, and dispels his gloom if in the opposite mood; whereas if the poser have a sour, sullen face it tends to neutralise the rarest skill he may otherwise possess, and thus fail to secure the desirable expression.

From the nature of his art, a single day may bring under the photographer's hand a host of persons comprising almost every type of physical and mental organisation—the ignorant and stolid, the flippant and conceited, the fastidious, the difficult, &c. To deal with all these, so as to avoid giving offence, often taxes his patience to an extent that might make him almost envy even the patriarch Job himself. Let him, however, not yield to impatience or irritation even with such as these; for they constitute perhaps the majority of those by whom he must (if at all) win his bread as well as professional distinction.

As a faithful likeness is the chief desideratum in portraiture, the mere head and bust are preferable, for a gentleman, to a larger proportion of the figure or one including both hands. And here I suggest the propriety of generally representing statesmen, lawyers, clergymen, and public speakers generally in a standing position, since in that posture they usually put forth those efforts which stir into activity their highest and best faculties, both of mind and heart. It is, moreover, in that posture only that the whole body co-operates with the face, in manifesting outwardly the sentiments of the mind. I may further remark that, in the standing position, the falling of the shoulders imparts to the head most freedom, grace, and dignity of movement. Yet to take a full-length standing figure of a public speaker, or even of a private gentleman, so that the picture shall express the true character of the individual, and the pose be natural, easy, and graceful, taxes the highest artistic powers of an experienced photographer.

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* Aluminium foil does not reduce the solution of potassic ferricyanide, even when boiled with it.

† Concluded from page 320.

But suppose it was required to represent a historian or a poet, a romancer or an editor, in short any person whose chief exertions of intellect are experienced and his favourite labours performed while wielding the pen at the desk: to place such a subject in a standing position would well-nigh certainly defeat the end desired; since he would be more likely to feel embarrassed and awkward than inspired with enthusiasm in consequence of the novelty and strangeness of his attitude. Thus, in representing Washington Irving, who would not, if possible, call up in him the precise mental mood from which sprang the inimitable *History of New Amsterdam*; the marvellous tale of Rip Van Winkle; the unmatched adventures of Ichabod Crane; the chivalrous *Tales of the Alhambra*; and the countless other creations, merry or pathetic, which have unsealed the fountains alike of smiles and of tears in the bosoms of the dwellers of two continents? Would you not also have Bryant, at the instant of taking, think and feel just as when the august panorama of *Thanatopsis* unrolled itself before his mental vision; Longfellow at the moment when those exquisite melodies of his "set themselves to music" for his inward hearing; and Dickens just as when he accompanied the illustrious *Pickwick* in his desperately adventurous travels, or attended the child-angel, "Little Nell," in her weary wandering towards that not untimely grave which unclosed the portal of her proper home in the highest heaven. And would you not fain behold Morris as when the *Lines to My Mother's Bible*, or of *Woodman Spare that Tree*, swam in the tears called forth by grateful memory, as he traced them upon paper; and Willis, in various moods, either in the person of "David bewailing Absalom," or in his own person annhilating some envious, impudent assailant.

Such, assuredly, are the mental states the artistic photographer would fain produce in the individuals here named, for the very sufficient reason that they stamp the noblest attainable expression on the face and the form. Be it noted also that among the subsidiary means for producing such states are the posture, the costume, and the surroundings generally. After all, however, the most essential of all requisites for the artist—that without which all other qualities, aided by the best appliances, are of little avail—is original genius, and, as previously hinted, one of the leading traits of such genius is a power of acting potently on other minds, not exclusively by thought and word, but also by a sort of magnetic influence. Therefore, as already stated, a desirable portrait is one in which may be almost read the agitated thoughts within and the words about to break forth. The momentary passions and emotions of joy, grief, anger, love, or hate may also, especially if intense, obliterate or partially shadow its wonted characteristics. So, too, the average expression may be intensified by an extraordinary excitation of its habitual feelings. Lavater says:—"Faces are as legible as books, the main difference being that they are sooner read and are far less deceptive." And Bacon, Haller, Sir Thomas Brown, Southey, and others have all recorded their faith in the face being a reflector of the soul.

At what, then, should the photographer aim while exercising his art? Not merely to get an exact outline of his sitter's face; it should be an unmistakable likeness of the original. Truthfulness is the first point of excellence. Nor should it be solely to so fill up and colour his sketch that, in shape, features, and tints it shall be true to the original. These items are, indeed, important, nay essential, to a perfect portrait. But still all these are insufficient in the absence of that expression which reveals the inward soul—that individuality which distinguishes the sitter from all human beings beside. The age of the sitter should, of course, be respected and considered by the artistic poser. An expression of gaiety and cheerfulness on the countenance, which will impart to it an amiable and noble frankness, may occasionally be duly appreciated and be appropriate as well as pleasing and acceptable, especially to a young lady.

Finally: in taking portraits of persons of all ages and both sexes, at the precise moment of sitting there will be imperatively required that affable, gracious, prompt, social quality—that discriminating, truthful, artistic eye—that ripe judgment and the skilled, dexterous hand which the artist-poser brings instinctively to bear upon his sitter, when the soul of the latter is to be roused to give expression to the lineament of the face. The photographic artist—especially the poser—who would win friends and patrons and achieve a high reputation must be good tempered, just, patient, forbearing, prompt and courteous towards all visitors without exception. But let me not be misapprehended. I do not assume to instruct my brother photographers or my unprofessional readers how to express the various passions. I can teach no man how to invent. I will say, however, that he whose eye and hand are obedient to his conceptions, may easily wear a cheerful face, exchange a lively word with both old and young, and yet not be rude. If he know his own place and keep it, such familiarity will *not* breed contempt but confidence. MARCUS A. ROOT.

Philadelphia, U.S.A.

PHOTOGRAPHY AT THE WAR.

FOR the benefit of any gentleman who may be about to proceed to Turkey with a camera I recommend that he provide himself with plenty of francs, as it is quite impossible to get such a mysterious machine as a camera through the custom-house without "siller." You are told on landing that if you require your baggage seen to at once you must "tip," and it must be a "straight" one. This is all very well as far as it goes; but one package appeared to excite the curiosity of the incorruptible officer. He proceeded to open it, and discovered therein my camera and lens. It was highly amusing to see him looking through the lens with his left eye carefully held down by his dirty fingers. I promptly placed my hand in front of the lens, when he expressed great surprise at not being able to see anything. After he had thoroughly enjoyed himself he made the discovery that I should have to pay seventy francs for introducing such a machine into the country. Of course I naturally objected to such an arrangement; but he settled the matter quickly and quietly by taking away my camera and lens, calmly locking them up in a cupboard, and then politely informed me that Monsieur could have the *leetle* things again when he had paid the francs.

I must request my readers not to suppose for one moment that I am in the habit of using strong language, but I am afraid—very much afraid—that in this instance I really did go in for one or two hearty English expletives. However, it was quite impossible to disturb my friend's equanimity; he was the politest of men and bowed gracefully in acknowledgment of every fresh flower of speech. It was with great reluctance I at length paid him, and regained possession of my camera. He then kindly offered to send my luggage on to the hotel kept by Missirie, commonly known as the "Misery," which offer I as politely declined. I then engaged a man who bends himself at right angles, and, I following, we then ascended to the heights of Pera, of course carefully avoiding the dogs and refuse with which the streets are strewn. Arrived at the hotel, and my luggage safely deposited therein, my man left me without a murmur; I had not apparently paid him too much, and therefore satisfied him. After refreshing the inner man I sallied forth to change my coin into Turkish money. Beware—oh! beware—of paper; let no man induce you to take bank notes to Turkey for any amount.

The next day I determined to start on an expedition at eight o'clock, previously engaging an arab steed—one sure of foot. I mounted and off I went to the shore of the glorious Bosphorus. Here I parted with my gentle steed and took boat, passing upwards in the direction of the Black Sea. After paddling some six miles I landed at Beleck, and there I commenced operations.

The first thing I saw was a fishing station of the most picturesque description, with Turkish houses and lofty mountains in the background. I unpacked, and with the inducement of a few piastres I got some old fishermen to stand for my picture. The light was rather dull, but I gave half-a-minute with the "rapid" lens, using it with the full aperture—with what result I do not know. I then entered the village, the streets of which are dirty, narrow, and very steep. Having my camera mounted on the stand and shouldered as a gun, I became an object of suspicion, so a shower of stones and mud followed my upward and onward course. Upward it was, and no mistake!—in fact, I felt something like the hero in Longfellow's *Excelsior*. But, alas! there was no maiden to request *me* to stay and rest. Upwards and onwards still, pursued by epithets of "dog of a christian!" accompanied by a dropping fire of the refuse of the village.

Things, I began to think, were looking anything but cheerful, when, suddenly, I turned a corner and a most magnificent scene presented itself to my view, which more than repaid me for the dubious welcome I received. Being deserted by my admirers I again commenced work, and exposed for another picture. By this time the light had improved, and I gave four minutes with a wide-angle lens. Having secured this picture I ascended to the top of the mountain, where the wild flowers grow in profusion. From this point a view could be obtained of the shores of Asia Minor, with villages dotted about the hillside, and some of these I determined to explore in the course of the day.

Travelling along the summit of the mountain I met an American gentleman, Dr. Long, of Roberts' College, which is situated upon a considerable eminence above the Bosphorus. This gentleman courteously invited me to inspect the collection of scientific apparatus at the College, with which I was very much pleased. I explained to him the working of Warnerke's tissue and roller slide, which excited his admiration. Parting cordially from Dr. Long I continued my journey in search of luncheon.

Descending from my elevated position I came across a village with three shops—consisting of a tobacconist's (so essential in the East), a fruiterer's, and a chandler's shop. I made inquiries for food, and was told that the chandler's shop was the only available place at which to put up. After inspecting the limited resources of the shop I selected some bread and cheese; but they had previously brought out a table into the street and covered it with a sheet of the *Graphic* as a table-cloth. Behold the table spread, but, oh! the first morsel of cheese! Can my readers imagine what tallow candles and soft soap are like when beautifully mixed? The bread was black and very bitter. They asked me very politely if I would drink. Having replied affirmatively—which was my only hope—I had visions of beer to wash down the delicious morsel. But, alas! no man can conceive what varnish would be like mixed with water! The fluid is supposed to be a choice Turkish drink called "mastic." After settling with my host—who proved a genial Turk—I departed for the shore and took boat for the Asiatic side of the Bosphorus. The recollection of that luncheon is so vivid that a description of my further travels must be postponed till the next mail.

Pera. EDWARD POCOCK.

FOREIGN NOTES AND NEWS.

HERR REMELÉ IN FEZ.—THE RUSSIAN GOVERNMENT AND THE JOURNALISTS.—DAMAGE DONE TO GLASS-HOUSES BY HAIL.—BACKGROUNDS IN NEW YORK.—DR. VOGEL'S DEVELOPER FOR BROMIDE OF SILVER DRY PLATES.—ANNUAL REPORT OF THE VIENNA PHOTOGRAPHIC SOCIETY.—POTASSIC PERMANGANATE AS A MORDANT.—A CONTRIVANCE FOR ACCELERATING THE PROCESS OF FILTERING.

THE *Mittheilungen* contains extracts from a letter from Herr Remelé, written from Fez on the eve of setting out for Tangiers. He has had good weather (the thermometer being sometimes at 30° R. in the shade), and has been very successful in getting views of Fez, which he reports as a perfect paradise. He hopes to return with a finer series of views than those he took with so much difficulty in the Lybian Desert. From another source we learn that the Sultan of Morocco examined Herr Remelé's apparatus with great interest, and has himself serious thoughts of joining the ranks of amateur photographers.

According to the same journal photography has been put to a singular use by the Russian Government in the present war. On the declaration of war the Russian Ministry of War at first forbade newspaper correspondents to follow the army, but afterwards, at the request of General Ignatieff, a certain number of accredited correspondents were allowed within the Russian lines; however, in order that they might be easily distinguished from unauthorised persons or spies, they were each ordered to wear a medal having a number on one side of it and his own photograph on the other side. This medal serves everywhere as a pass, and the portrait on the reverse side leaves no doubt as to the identity of the wearer with the person authorised.

On the 12th June a severe hailstorm swept over Berlin, doing great damage to photographic studios, and giving rise, at a recent meeting of the Berlin Photographic Society, to a discussion as to the best means of ensuring glass-houses against similar injury for the future. In the glass-house of Herr Prümm forty panes of glass were broken, seventy in that of Herr Suck, fifty in that of Herr Schauer, and thirty-six in that of the Industrial Academy. At the south side of the city the storm was unfelt. At Colome there was a hailstorm on the same day, and some hailstones were picked up weighing thirty grammes.

The *Mittheilungen's* New York correspondence for this month is devoted to the subject of backgrounds, a number of which are described. Amongst others is a snow scene which did good service last winter in Mr. Sarony's studio—a landscape, including mountain, valley, and river, all covered with a mantle of snow. With this background children were taken sliding down hill on a sledge, or young people in the act of skating.

In compliance with numerous requests Dr. Vogel publishes in the *Mittheilungen*, at the end of a notice of Boivin's emulsion process, the developer used in the Royal Industrial Academy for bromised silver dry plates, whether prepared in the bath or with emulsion. The plates are coated, after exposure, with alcohol of 80 per cent., and then laid in a horizontal position. Meantime a mixture is made of—

a 1 to 10	Alcoholic solution of pyrogallic acid	0·5 cubic centimetres.
	Ammonia	3 drops.
1 to 4	Solution of bromide of potassium	1 or 2 drops.
	Water	10 cubic centimetres.

The plates are washed with water until the latter runs off clear, after which they are coated with the developer. The image appears very quickly, and may be intensified by the addition of fresh pyrogallic acid and ammonia. Should sufficient density not be secured with the alkaline developer, then wash the plate and coat it with very dilute acetic acid 1:100, and intensify with the usual silver intensifier—citrate of silver and pyrogallic acid. Wilde's emulsion plates were fogged with the foregoing developer, but when the quantity of ammonia was reduced one-half they developed quite clear.

The *Correspondenz* contains the annual report of the Vienna Photographic Society, from which it appears that that Society now numbers 332 ordinary and 13 honorary members. The President took the opportunity of expressing his regret at the small number of competitors for the Society's prizes.

Permanganate of potassium is rumoured to have found a new way of being useful, namely, as a mordant for fixing aniline dyes in cotton and woollen stuffs. The stuff to be dyed is drawn through a chemically-pure solution of permanganate of potassium until it has become a clear brown colour; it is then washed in cold water until the latter runs off free from colour. The web is then drawn through a weak solution of acetate of tin, which removes the brown colours, after which it is subjected to repeated washings in water, then a dip in a tannin bath, and, finally, one in the dyestuff. The great advantage of this process—especially for stuffs which are a mixture of cotton and wool—is that they can be dyed any colour by means of a single dip in the dye tub. According to the *Correspondenz* this is the application of permanganate of potassium to which Herr von Stefanowski refers in his remarks on the toning of carbon prints.

In the *Zeitschrift für Analytische Chemie* a simple contrivance for the acceleration of the process of filtration is given. To produce a vacuum Herr C. Holthof uses an ordinary tin syringe, the lower tube of which is unscrewed and replaced by a doubly-bored gutta-percha plug through which two glass tubes are put. Upon one of these tubes a gutta-percha Bunsen's ventilator, opening outwards, is placed; the other tube is bent round and expands. The wider end is closed by a second cork, through which a third glass tube is passed, and in the interior of the expansion a second ventilator is attached to the third glass tube, while its outer end is connected with a large bottle. The cork of this last is bored in three places, one aperture serving to form the connection with the apparatus already described, one communicating with a manometer, and the third with the vessel containing the liquid to be filtered. By drawing out the handle of the syringe a vacuum or, rather, a space containing rarefied air is formed in the bottle, and is a material aid to rapidity of filtration.

Meetings of Societies.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

ON Thursday, July 5th, the Board of Management held the usual monthly meeting at 174, Fleet-street, E.C.

The minutes of the previous meeting having been read and confirmed, Mr. Ehlers was elected an ordinary member of the Association.

The half-yearly balance sheet was then placed before the meeting, and after being carefully examined it was adopted unanimously.

Various estimates for printing a new edition of the rules were then considered. The selection of one having been made, the Secretary was instructed to expedite the issue.

The following motion was then brought forward:—"That any member of the Board of Management not having attended six monthly meetings of the said Board in the course of the year shall not be eligible for re-election." After some discussion it was proposed by Mr. Lavender and seconded by Mr. Atwood, and carried.

Grants for various purposes having been ordered the meeting was adjourned till the 2nd of August.

WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.

THE members and friends of the above Society had their second monthly excursion on Friday last, the 6th inst., the scene of their wanderings being Milner Field, the seat of Titus Salt, Esq. Most of the party arrived by the 1.50 p.m. train at Saltaire Station, and proceeded to Saltaire Park, where it was proposed that they should wait till the remainder of the party arrived.

A few pretty views of Saltaire were taken from thence. The park appeared to please the members very much. However, the other members appearing, all decided to lose no time in making for Milner Field, where, through the kindness of Mr. Titus Salt, they were allowed to look through the grounds and conservatory, and also through his splendid greenhouses, where he has a large quantity of vines. After leaving Milner Field the party made for Shipley Glen—a romantic little place, and also very popular with holiday-makers.

After enjoying themselves in the glen for an hour or so, the party thought that tea would be very acceptable; so they set off for Shipley, where a substantial knife-and-fork tea was provided; and, after tea, they had some vocal and instrumental music and a dance. The party were compelled to break up rather early, on account of securing a homeward train; but all agreed that they had had a pleasant half-day's holiday. It is proposed to go to Temple Newsham on the 1st of August.

Correspondence.

MEETING OF THE PHOTOGRAPHIC SOCIETY OF FRANCE:—M. CHARDON'S EMULSION PROCESS.—FORMULÆ FOR M. GOUGENHEIM'S COLLODION.—AN ANTI-PHOTOGENIC DYE.—A MACHINE FOR EQUALISING THE ACTINIC POWER OF DIFFERENT COLOURS.

THE Photgraphic Society of France held its general meeting on Friday, the 6th instant,—M. Davanne in the chair.

M. Magny presented some very fine proofs which he had obtained by the emulsion process. We are greatly indebted to M. Chardon for the great *élan* given to emulsions in this country; for before his presentation, and the publicity given to his process, very few manipulators had succeeded in making good emulsions.

M. Braun presented some admirable proofs (in carbon), being reproductions of pictures in the late *Salon* of 1877.

M. Schaeffner presented to the Society a new transfer-paper, by which line drawings, reproductions, &c., can be transferred to lithographic stone with the greatest ease.

M. Gougenheim—well known in Paris for his success in the enamel process—gave a very good formula for a rapid collodion, together with a suitable developing solution.

A MEMBER said he had had great success with the collodion as prepared by M. Gougenheim, and especially with the iron developing solution as proposed by that skilful operator.

I therefore send the formula to the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY :—

Collodion.

Ether	8239	grains.
Alcohol	6237	,,

Cotton.

Double iodide of cadmium and potassium	77	grains.
Iodide of ammonium	$61\frac{3}{5}$	,,
,, cadmium	38	,,
Bromide of ,,	$46\frac{1}{5}$	,,

Iron Solution.

Distilled water	15,400	grains.
Double sulphate of iron and ammonia	770	,,
Sulphate of copper	308	,,
Acetic acid	539	,,
Alcohol	308	,,

Intensifying Solution.

1.	Distilled water	7700	grains.
	Acetic acid	308	,,
	Alcohol	1386	,,
2.	Distilled water	1540	,,
	Nitrate of Silver	77	,,

The interest and the honours of the evening were carried off by M. Bardy, the celebrated chemist—well known to the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY by his experiments on the actinism of artificial lights and their uses in photography. M. Bardy has made a discovery which will render great service to the photographic community—which is that of an anti-photogenic dye or colour. It is well known how difficult it is to choose a yellow-coloured pane of glass for the dark room which will intercept the actinic rays. This M. Bardy has found to be almost impossible; so, to turn the difficulty, as it were, he experimented with a number of dyes, and has succeeded in discovering one admirably adapted to the office demanded of it, viz., to keep out of the dark room all the actinic rays which would fog the plates. He began as follows :—"The interesting process of emulsions, as published by M. Chardon, requires that in the manipulations a light be employed which has no action upon the bromide of silver. I believe I can render service to those who wish to dabble a little in emulsions, as well as to those who desire to study fully that process, by indicating an easy means how to replace yellow glass, which, unhappily, leaves a passage for a great number of actinic rays. During the last two years in my studies employing silver bromide for dry-plate work, I have made use of white glass coloured by a preparation of aniline to light up my dark room. Among the numerous substances which I tried, one above all has in a high degree the property to arrest the active rays of light. This substance is named 'chrysoïdine.' Chrysoïdine is a crystallised substance, excessively rich in colouring matter, of a yellowish-red appearance, soluble in water and alcohol, which facilitates its employment in divers matters, such as a varnish to cover a pane of glass, or intermixed with gelatine in order to make a pliable film, or a stain or dye in order to colour paper. To make a varnish it suffices to dissolve the powder in a varnish made with alcohol, leave it to cool, and then to filter it; it can then be employed as the ordinary varnish.

"Collodion *à la* chrysoïdine is prepared by replacing the alcohol by an alcoholic solution saturated with chrysoïdine. The ether will precipitate a part of the product; it is, therefore, necessary to leave it a certain time to clarify itself, and then to decant it with care.

"This preparation, poured upon a sheet of glass as collodion, gives a very strong colour, and replaces very advantageously yellow glass as employed at the present day. In some cases it is preferable to cover both sides of the glass with the varnish. One of the best means to utilise this product is to make pellicles of gelatine :—

White gelatine	308	grains.
Water	1925	,,
Chrysoïdine	40	,,
Glycerine	46	,,
Water containing two per cent. of alum	616	,,

Begin by dissolving the chrysoïdine in the 1925 grains of hot water; filter, and allow it to cool. Proceed in the same manner as if you desired to make pellicular negatives by the method of M. Jeanrenaud. It is necessary to have a pellicle as thick as possible, to obtain which, after having covered with talc and collodionised the glass, put a rim round it composed of soft wax. A kind of tray is then obtained, into which the solution of gelatine is poured. The glass is now levelled, and the gelatine left to dry. When dry it is coated with a collodion containing castor oil. If the formula has been carefully followed a pellicle will be obtained of a ruby-red colour, which will arrest nearly the whole of the actinic rays of the spectrum.

"An excellent antiphotogenic paper can be made by impregnating a thickish white paper with a solution of—

Water	770	grains.
Alcohol	1540	,,
Chrysoïdine	47	,,

The paper dyed in this solution can be employed to intercept the actinic rays from entering the dark room for packing all substances liable to be spoiled by white light, such as dry plates, wet and dry emulsions, &c., &c.

"A magnificent red dye named 'eosine' is equally soluble in water and alcohol, and can be employed in the same manner as chrysoïdine; but, as its power of colouring is inferior to the last-named substance, double the quantity must be employed.

"I was led to employ these different dyes in experimenting with the spectroscope upon the power of absorption of different colours extracted from coal. I will cite the following results, which will show the usefulness of the spectroscope in seeking the actinic properties of different dyes :—

"1. *Fuchsine, or Aniline Red.*—This substance, so well known at the present time, presents a characteristic band of absorption; this band is situated in the green division of the spectrum. If the micrometer of the spectroscope be regulated in such a manner that the division 100 coincides with the yellow rays of sodium, and, at the same time, a small glass tray containing a solution of fuchsine be interposed before the slit of the instrument, a large and sharply-defined band can be seen covering all the part situated between the divisions 110 and 125 of the micrometer. By adding successively more dye to the solution already in the tray, so as to deepen the colour, the band of absorption enlarges to the right as well as to the left, covers up the yellow rays of sodium, and finally allows only the orange and red rays to pass, together with a feeble quantity of violet rays. This substance must, therefore, have some influence upon the various preparations in which the sensible salts of silver are employed effectively. It may here be remarked that even a concentrated solution allows a small quantity of actinic rays situated in the violet to pass through. A thick pellicle of gelatine, deeply coloured with fuchsine, interposed between the light and a plate prepared with the emulsion of M. Chardon permits sufficient light to pass through to make a complete positive in fifteen seconds.

"2. *Napthaline Rose.*—This substance possesses a band of absorption situated between the divisions 120 and 145. A deeply-tinted solution appears to intercept all the rays except the orange and the red. Although the eye cannot perceive any violet rays, it is possible that by the widening of the band of absorption the violet and the ultra-violet rays of the spectrum can pass. This substance, employed to colour a gelatine pellicle operated upon as in the case of the former dye, gave a positive in sixty seconds.

"3. *Eosine.*—This dye presents nearly the same properties; the band of absorption is, perhaps, a little narrower. It is situated between the divisions 120 and 140. If no other substance could be found the two last-named dyes might still render service.

"4. *Chrysoïdine.*—This colour presents a great peculiarity, which is that no band of absorption is visible; and if solutions more and more dense be placed before the slit of the spectroscope a kind of screen can be observed, beginning at the violet and advancing towards the division 85 of the micrometer. From this moment, whatever may be the concentration of the solution, the screen advances no further, and the red and orange rays diminish only in intensity.

"This peculiar property compels one at first sight to think that chrysoïdine was a perfect antiphotogenic agent, and experiments have confirmed that opinion. An emulsion plate was placed during five minutes behind a pane of glass covered with a gelatine pellicle, deeply coloured by chrysoïodine, and gave no trace of an image, although the alkaline development was employed. A pane of yellow glass was experimented upon under the same circumstances, and a positive was obtained in twenty seconds. This pane of yellow glass had been employed for years in my laboratory in working with wet collodion. Upon being examined by the spectroscope it was found to intercept no ray of the spectrum; it simply enfeebled the light passing through it."

M. Bardy informed the Society that he had obtained great success with M. Chardon's process.

M. Balaquy developed before the Society some negatives made by the emulsion process of M. Chardon. He employed the alkaline developer, and obtained sufficient intensity with pyro. and carbonate of ammonia.

An old *employé* of M. Leon Vidal's presented to the Society a little model of a machine which he had invented, intended to be placed before the lens during exposure to equalise the actinic power of the different colours to be reproduced. The model, as placed before the Society, was in the shape of a disc, irregularly divided and glazed with the different colours of the spectrum. The wheel or disc is made to rotate and bring the several different-coloured glasses between the lens and the object to be reproduced. The inventor could not show the members any good results obtained with the model exposed, alleging want of time.

3, *Place Bréda, Paris, July* 10, 1877. E. Stebbing, *Prof.*

CORRECTION.

To the Editors.

Gentlemen,—In a paper published in the Journal a few weeks since I am made, by an error of the press, to speak of the "electric" action of certain preservatives, &c., instead of the "*elective*" action, as written.

In a paper on precipitated emulsions I mentioned that, whilst the loss when the water (or bath) was poured into the emulsion was not greater than when the emulsion was let to set, the loss when the emulsion was poured into the water was materially greater, and was estimated as at least one-sixth more. By "estimated" is not to be understood estimated by conjecture, but by actual weighing.—I am, yours, &c.,

Philadelphia, U.S.A., June 26, 1877. M. Carey Lea.

THE LATE O. G. REJLANDER.

To the Editors.

Gentlemen,—Your readers will be glad to hear that steps are being taken to furnish the hitherto unmarked resting-place of the late O. G. Rejlander, in Kensal Green, with a suitable gravestone. One of Rejlander's old friends—a sculptor of some note in Sheffield—has generously promised to erect a suitable head-stone, bearing upon its face a bronze medallion of the well-known artist. The medallion is about ten inches in diameter, and the stone bearing it, while simple in design, is of a handsome and solid character.

Of the competence of the gentleman to execute his self-imposed task I need say little. Being a labour of love, Mr. Theophilus Smith may well be relied upon to execute a faithful likeness of the master of photographic art, whose friends and disciples were legion; and, when I mention that Mr. Smith boasts of possessing the largest and most complete collection of Rejlander's works, there is little need to tell of the admiration which the sculptor feels for his deceased friend. The portrait, I am told, is finished ready for casting, and the stone has merely to be lettered with a simple inscription in order to be ready also.

Mr. T. Smith's standing as an artist is too well known to require any introduction to photographers, and if he be as successful in the present instance as he has been in the case of two excellent busts of Mr. Roebuck, M.P., and Professor Sorby, F.R.S., recently executed by him, we shall all owe him a deep debt of gratitude. To those as yet unacquainted with his ability I would mention that there are to be seen just now at the Royal Academy two very able productions from his hands.

Mr. Smith suggests that it would be desireable, in order to make the monument more complete, to enclose the grave with a coping stone or rail. To do this satisfactorily, as also to cover certain incidental expenses, I desire to collect a sum of from ten to twenty pounds, and I now invite those of your readers who are willing to aid in subscribing this amount. I shall be happy to give an account in these columns of all moneys so subscribed if you will permit me; and I trust to be able to forward you in a few weeks' time another note stating that the whole has been well and satisfactorily completed.—I am, yours, &c.,

H. Baden Pritchard,

Late Treasurer to the Rejlander Fund and Hon. Soc. of the Photographic Society of Great Britain.

Royal Arsenal, Woolwich, July 9, 1877.

TRANSPARENT SPOTS IN EMULSIONS.

To the Editors.

Gentlemen,—In your article on *Lateral Halation* I was glad to find a confirmation of my own views on the subject of the formation of clots in emulsions which have remained undisturbed even for a short time. I am convinced that these aggregated masses (to remove which ordinary filtration is useless) are the cause of the circular transparent spots so annoying to emulsion workers.

On exposing a prepared plate these minute masses, in consequence of their extra size, would not, I imagine, be affected by light throughout; and I believe that on development they are readily dissolved by the addition of ammonia, leaving a patch of bare glass. However, in my hands, several vigorous shakings of the emulsion will effectually break up the clots, and a perfect film is the result.

There should be no necessity to allow the emulsion to remain undisturbed for half-an-hour before use, as I am directed to do in some instructions just to hand.—I am, yours, &c., M. W. Magar.

19, *Lorrimore-square, Kennington Park, S.E., July* 4, 1877.

PHOTOGRAPHY IN COLOURS.—"A NEW INVENTION."

To the Editors.

Gentlemen,—I have recently got sight of the following circular printed in the German language:—

> "I have the honour to inform my fellow-artists that after many endeavours I have succeeded in the production of pictures in every size—groups, summer-houses, landscapes, &c.—in *natural colours*, even as they are represented in the camera, without expense and almost without loss of time. At the same time the said pictures represent themselves on the positive as very attractive, and considerably more vigorous than common photographs, even as the method of production is indispensable to every photographer; consequently I feel it as a duty to the brethren of our art to communicate to them this interesting secret, together with a proof, on condition of a remittance of twenty marks.—Yours, most respectfully," &c.

I am not able to say anything more on this German publication.—I am, yours, &c., Peter Chr. Koch.

Copenhagen, July 6, 1877.

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Porotype.—Porotype is, we (*Scientific American*) learn from the *Photographisches Archiv*, a newly devised process for copying copper-plate engravings, woodcuts, and other designs of a like nature. It is based on the principle that porous paper which has been printed upon by fatty ink loses, wherever ink attaches, its porous character. An engraving upon paper is only porous when there is no ink, and will neither allow gas nor liquid to penetrate wherever the black ink appears. A gas which acts upon a certain chemical agent, and either bleaches or discolours it, is permitted to penetrate a copperplate engraving or woodcut where possible, and, coming into contact as it permeates with paper which has been suitably prepared, brings about a reaction—that is to say, wherever the gas has found means to penetrate, the colour of the prepared paper alters, and a copy of the engraving is in this way produced. In the process, therefore, four papers are necessary:—One which is capable of generating gas, and which is soaked with hyposulphite of soda; a second, or sensitive paper, which is, in fact, paper treated, first of all, with extract of nut-galls, and afterwards with sulphate of iron solution (ink paper); thirdly, filter paper; and fourthly, oiled paper. The copying of the engraving may be effected in the leaves of a book under pressure. The engraving is put upon the sensitive paper, and upon the engraving is laid the generating paper. Over these is laid a sheet of filter paper which has been previously impregnated in dilute sulphuric acid; then a sheet of plain filter paper; and, lastly, the oiled paper. The whole is pressed together for ten minutes, when the copy ought to be finishad. A report upon the process by Professor Böttger is not very favourable to it.

Photography in Court.—At the Westminster County Court, on Friday last, the 6th inst., the case of Moreton *v.* Diss was tried before Mr. Judge Bayley. The plaintiff, a photographer in Oxford-street, sued the defendant, a picture-frame maker, of High-street, Bloomsbury, to recover the sum of £5 for damage done in the mounting and framing of two photographs taken by the plaintiff, and entrusted to the defendant to mount and frame. Mr. H. T. Roberts, who appeared as solicitor for the plaintiff, said his client was instructed to execute two quarter-plate pictures of a lady and gentleman who were going to India, and to have them framed in a manner decided on. The negatives were shown to the sitters and approved of. Pictures were printed from them, and sent with particular instructions to the defendant to frame and mount them. They were to be in Morocco cases, perfectly air-and-dust-proof, and the price stipulated for was the sum now sued for.—The plaintiff stated that the negatives were carefully executed, and the proofs when approved of were sent to the defendant and were to have been returned in three days, instead of which a week elapsed; but, owing to some preparation the defendant had used, the pictures were entirely spoiled—so much so that his customers, having refused to take them, had sailed to India without them, leaving the pictures on his hands, and as they were of no value to him he now sued the defendant in order to recover the loss he had thus sustained. In cross-examination the plaintiff admitted having received a deposit of fifty shillings when the order was given, and therefore he could not say why he claimed £5.—Mr. Willis urged, on the part of the defendant, that his client was not liable for the sum claimed, as the plaintiff having received £2 10s. on account, his particulars were not correct; and, moreover, he should put the defendant in the box, and prove that the pictures had not been properly washed, and hence they had faded, as his client had taken every possible care in mounting them.—The defendant, in corroboration of this statement, said he had taken every care; the pictures were mounted with pure isinglass, which would not affect the pictures if they had been properly "fixed."—The plaintiff said that that was the real cause of the misfortune, and he would, if his Honour adjourned the case, bring skilled witnesses to prove that it was not the proper way of mounting photographs. The Judge, looking at the pictures, said there was evidently a fault somewhere; but as the plaintiff had received fifty shillings on account, which he had not returned to his customer, and as the defendant had been at some loss in mounting the pictures, he would nonsuit the plaintiff, and give him leave, on a future occasion, to sue again for fifty shillings, when he could prove, perhaps, that the pictures were spoiled by improper mounting.

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ANSWERS TO CORRESPONDENTS.

Photographs Registered—

H. Murdoch, Ayr.—*View of Pulpit in Old Church, Ayr.*

John M. Carroll, Liverpool.—*View at the Bicycle Fête in Sefton Park Liverpool.*

☞ *Correspondents should never write on both sides of the paper.*

H. B. B.—Received. In our next.

Alpha.—We wrote to the address you kindly forwarded, but "the bird had flown."

A. T. R.—The precipitate is sulphate of lead, which must be filtered out, leaving the nitrate of iron in solution.

Amateur (J. H. W).—The formula required will be found on page 105 of our Almanac for 1874. The group is very successfully taken; the subject is a difficult one.

John Forbes.—Get your solicitor to apply for a return of the difference. We advise you not to go to much expense in the matter, as we fear it is a doubtful case.

An Artist (Dundee) wishes to know in what gallery Rosa Bonheur's picture of *The Horse Fair* is to be found, and whether it has been in its present *locale* for the last three years.

W. B. M. (Newry).—The production of such a plate as that described must be the work of a copperplate engraver. It could be engraved at any price from two guineas upwards, according to the amount of work expended upon it.

G. N. (Ipswich).—1. The mercurial method is the easier, but silver is the more reliable of the two.—2. Follow the directions given in our Almanac for 1873.—3. By heating the plate, previous to applying the varnish, it will dry with a bright surface.

Amateur (T. L., Burton-on-Trent).—Make use of a diaphragm having an aperture of about $\frac{f}{20}$ or $\frac{f}{25}$, and let the sun be partially on the house.—2. The quantity of magnesium required must be determined by actual experiment. Try what effect is obtained by half-a-yard of the ribbon.

Doubt.—We are inclined to attribute the spots to the bleaching action of bronze powder. We may observe that the bronze lettering at the foot of the card imparts a paltry appearance to the pictures. It would be much better to print the name on the face of the card in the same colour as that on the back.

Liverpool Amateur.—It is somewhat surprising that such a well-defined picture has been obtained by making use of the *back* lens of a portrait combination. If the front lens be employed in a similar manner the results will be still better. The convergence of the lines of the house is caused by the camera having been pointed upwards when taking the negative. If the camera be not provided with a swing back it must be kept quite level, otherwise the picture will be distorted.

T. B. (Edinburgh) has met with a mishap, which he describes in the following note:—"I purchased a few days ago some cyanide of potassium for the purpose of fixing ferrotypes. In breaking it into pieces to enable me to put it into a bottle some splinters flew in different directions. I have since learned the *very* poisonous character of the chemical, with which at the time I was comparatively unacquainted, and am rather anxious as to what the result might be if any of the splinters should get into food. I would be much obliged if you could give me, through the medium of your correspondence column or otherwise, an answer to the following queries:—1. Would the quantity contained in a splinter such as is broken from a piece of the chemical snapped between the fingers (which is very little) be likely to cause serious consequences? 2. How much, in grains, would it take to kill a human being? 3. Does the article on photographic hygiene in your issue of the 3rd July, 1874, contain the simplest formula of antidote for the poison? 4. Is there anything else as good as cyanide for fixing ferrotypes, or is it a necessity? 5. What quantity is required before serious consequences would be entailed? In several numbers of The British Journal of Photography I find the practice of using cyanide much condemned. I have hitherto used hypo. for fixing my negatives, and, rather than run the risk of 'fixing' any of my family, I will give up ferrotypes and return to my old ways. I have no proper dark room, and the aforesaid breakage of cyanide took place in the kitchen; hence my anxiety."——We reply:—The great bulk of the cyanide of potassium prepared for, and sold to, photographers at the present time, contains so little cyanogen as not to justify any very serious apprehensions as to its poisonous nature and the mischief likely to ensue under the circumstances narrated. We find that cyanide is advertised for photographers' use at one shilling and ninepence a pound. This price indicates that it is composed, for the most part, of carbonate of potash. The cyanide that we are using, and prefer using on the score of *economy* as well as efficiency, cost us six shillings a pound. This kind, we need scarcely say, is exceedingly poisonous. We recommend cyanide in preference to hyposulphite of soda as a fixing agent for ferrotypes on account of the better colour given to the picture. After this explanation we do not consider it necessary to answer, *seriatim*, the queries put by our correspondent. The article referred to contains full information on the subject.

Boz (Liverpool).—A suitable condenser may be constructed by combining a plano-convex lens one inch in diameter and one and a-half inch in focus with a lens of a similar form half-an-inch in diameter and one inch focus. If the larger lens were achromatised it would be so much the better.

Geo. Hudson.—You may produce a very intense degree of cold (many degrees below zero) by mixing together twelve parts of crushed ice, five parts of chloride of sodium, and five parts of nitrate of ammonia. Place the mixture in a wooden pail, and insert in this a very thin glass vessel containing the materials upon which you are making experiments. Cover the pail with several thicknesses of felt, and the temperature will be kept low for a sufficient time to enable you to determine the effect produced.

Received.—W. Harrison; Maxwell Jackson.

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Carbon Tissue.—Our readers will observe, from an advertisement in our current number, that the Autotype Company has entered into an arrangement with Messrs. Marion and Co., by which the latter firm is empowered to manufacture carbon tissue and transfer papers, and to supply these preparations to the licencees of the Autotype Company. We have no doubt that this arrangement will prove useful to many carbon photographers.

The Scarborough Aquarium.—Mr. Sarony, of Scarborough, has just completed a set of cabinet and *carte*-sized views of the Aquarium recently opened in that fashionable watering-place. Although they have been taken under circumstances unfavourable to the production of brilliant photographs, owing to the want of light, yet these views, despite the long exposure they must necessarily have received, are very bright and, in some instances, even sunny-looking. It is easy to predict for this series of views a large share of public appreciation, as they will form pleasing and attractive mementos of a charming holiday resort.

The Heliotype Company.—From a circular we have received we learn that the winding-up of the Heliotype Company, Limited, whose lessees Messrs. B. J. Edwards and Co. have been for the past two years, and the consequent removal of their works from Lincoln Terrace, Kilburn, have given rise to a report that they have discontinued business as photo-mechanical printers, &c. This rumour is wholly unfounded, as extensive works are being fitted-up in Tottenham, for the more energetic execution of orders. Mr. B. J. Edwards has retired from the firm, which will in future be carried on under the name of H. M. Wright and Co.

Card Mounts and Cloud Negatives.—We have to acknowledge from Messrs. Marion and Co., and Mr. A. Ford Smith (Llandudno), respectively, the receipt of a selection of card mounts for landscapes, and of waxed paper cloud negatives, together with landscapes in which the skies have been printed-in from these negatives. The mounts have a chaste border, some of them having also a very effective tint upon which the photograph is mounted. The name of "Marion and Co." is a sufficient guarantee for their excellence in regard to quality and finish. Of the utility of flexible cloud negatives we need say little; every photographer appreciates the value of a fine sky in a landscape, and we know from actual trial, as well as from four admirable specimens received from Mr. Ford Smith, how fine is the effect obtained from a judicious introduction of clouds by these flexible negatives. After the facilities now afforded to photographers, we trust we shall see no more white, chalky skies. The method of using such negatives is simple; they have merely to be put over the ordinary white sky as it comes from the printing-frame, shading the landscape with a cloth, and then exposing to the light for a very brief period.

☞ **Editorial Communications should be addressed to "THE EDITORS"—Advertisements and Business Letters to "THE PUBLISHER"—at the Offices, 2, York Street, Covent Garden, London, W.C.**

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METEOROLOGICAL REPORT.

Observations taken at 406, Strand, by J. H. Steward, Optician.

For the Week ending July 11, 1877.

These Observations are Taken at 8.30 a.m.

July.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks
5	29·97	NW	53	60	72	51	Cloudy
6	29·88	NW	53	59	68	49	Cloudy
7	30·11	NW	53	58	69	47	Cloudy
9	30·32	W	55	60	71	50	Cloudy
10	30·24	W	59	65	80	55	Fine
11	30·07	W	59	64	73	55	Cloudy

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 898. Vol. XXIV.—JULY 20, 1877.

ON CLEARING NEGATIVES.

More than once during the last few months reference has been made to the operation of clearing negatives either before or after intensification and fixing—a proceeding the necessity of which is, perhaps, not of frequent occurrence in ordinary work, but of sufficient importance in some processes to warrant our devoting a little attention to it. It is chiefly useful in connection with the reproduction of line work; indeed we may almost say it is an absolute necessity in that class of work, as the requirements of purely black and white negatives demand such a degree of density, combined with perfect transparency of the lines, that the ordinary methods of production frequently fail to come up to the proper standard of excellence. It is useful also, in many instances, in conferring clearness and brilliancy on the lights in transparencies upon glass, for which purpose it may be advantageously employed without the drawbacks attending its application to negatives in half-tone.

For the latter purpose it is questionable whether it is of any practical utility except in very isolated cases, as, owing to the nature of its action, it is most probable that, while improving the negatives in one respect, it works greater damage in another direction. The majority of negatives of this description which require clearing up are those which, owing to under-exposure or other causes, have undergone a forced development or intensification, resulting in the formation of a slight deposit over the whole surface. This fog will be greater or less according to circumstances, and will generally be found to increase in inverse ratio to the strength of the detail which has necessitated the forcing. It is, then, obvious that the very principle of this course of treatment is against its employment in such cases; for, while removing the objectionable fog, it acts simultaneously upon the image, and the weaker portions (in securing which the evil has made its appearance) are the first to suffer and disappear with the fog. When the veil is but slight, and the character of the negative is such that a little lowering of the weaker parts is permissible, the remedy may possibly be applied with success as regards the removal of the fog; but in nine out of ten such cases no benefit accrues, and the operation is unnecessary. It is only when the detail and half-tones, already feeble, are still further degraded by a general veil that it becomes necessary or desirable that the latter should be removed; and unfortunately we are not in possession of any process capable of exercising sufficient discrimination to remove the veil without injuring the gradations of the negative.

Another objection to the adoption of this course of treatment in the case of negatives in half-tone is found in the difficulty of controlling its action with sufficient nicety—of judging of the exact point at which to stop. This is doubly the case where the result is gained by two distinct operations, on account of the difficulty of judging correctly the amount of silver converted by the first solution until it is removed by the second. This defect is of minor importance in line reproductions, as, owing to the strength and comparative uniformity of the deposit upon the whites, a little over-action is immaterial. Equally to be guarded against, whatever may be the nature of the image, is irregularity of result arising from the unequal action of the solutions on different portions of the plate. This can only be prevented by immersing the plate in a dish instead of pouring the solution from a cup or bottle; but even then it occasionally happens that the film itself exhibits a tendency to unequal absorption—a condition which it is difficult, if not impossible, to combat.

Many plans for effecting the removal of fog have been recommended and used, chiefly, if not entirely, based upon the conversion of the deposit of silver into the state of a haloid, which is then dissolved by means of cyanide of potassium or hyposulphite of soda. The first of these substances, by virtue of its activity as a solvent of the silver image, has been recommended *per se* as a fog remover, and where the evil is extremely slight it, no doubt, produces the desired effect; indeed, one great recommendation in its favour as a fixing agent, especially for positive and ferrotype work, is the brilliancy and cleanness it gives to the picture by removing any slight veil which may exist. But its continued action results in a general lowering of the density of the image, which, for the purpose we have in view, is not desirable. Comparing the action of cyanide with that of iodine upon the negative image this difference is noticeable—that whereas the former appears to attack the whole of the image equally, or if anything to show the greatest effect upon the denser portions, the latter acts much more rapidly upon those parts where the deposit is most feeble. For this reason iodine has been generally adopted when it is desired to remove fog or to give brilliancy, while cyanide may be employed for producing a general lowering of the density.

The *rationale* of the iodine method is extremely simple in theory, but it requires considerable practice as well as judgment to ensure a successful result. The iodine solution is made by adding to a convenient quantity of water sufficient of the tincture to make it "the colour of sherry," as the instruction books say; but as there are various descriptions of sherry—pale, golden, and brown—this is a rather ambiguous direction, especially as the result depends a great deal upon this one point. It is almost impossible to give the exact strength, as that will depend greatly upon the physical characteristics of the film to be operated upon, as well as upon the nature of the image, whether line, half-tone, or transparency; but it may be stated generally that it is better to err on the side of weakness than *vice versâ*. The solution may be the colour of *very pale* sherry, as there is then less chance of unequal action and less danger of eating away the finer details.

In using the solution it is best not to attempt to produce the full effect in one operation. It requires a practised eye to judge exactly when the requisite point is reached, and the inexperienced operator is more liable to over than under do it; hence we recommend that the plate be immersed for a few seconds in the iodine solution, and then washed, "fixed," and examined, and the changes noted. A second or third immersion in the iodine followed by the same treatment will bring about the desired result by gradual steps, which render it easy to judge to a nicety where to stop. If, however, the operator prefer to secure the full result in one operation, he must be able to judge readily between the appearance of the silver deposit and the iodide, and by examining carefully the back of the negative to stop the action as soon as the parts which require to be transparent are fully converted. This, in the case of a negative devoid of half-tone, is not a matter of much difficulty, but in a negative in half-tone the conversion of the whole of the deposit in the deepest shadows is no guide as to the higher gradations; and if the "iodising" be continued until clear glass shadows are obtained the result will be as likely as not unsatisfactory.

The strength of the second solution of cyanide or hypo. is not a matter of much moment, as the whole of the iodide formed is to be removed; but if the former be used care must be taken that it is not strong enough to dissolve the unaltered image. It is unimportant which of these two solvents be employed unless the image is required to undergo subsequent treatment, in which case cyanide is preferable.

Another plan which is intended to do away with the uncertainty arising from the necessity of two operations consists of a mixture of the halogen with the solvent; that is to say, the iodine is added to the solution of cyanide or hypo., and applied to the plate until the desired effect is obtained. This would certainly be the preferable system were it not that the compound solution is apt to be unmanageable. Both cyanide and hypo.—especially the former—when mixed with iodine, dissolve the silver image readily, the solvent action depending upon the relative proportions of the ingredients and the strength of the solution. In order to arrive at the best strength try the solution upon a spoilt plate, dropping in tincture of iodine until the solvent power is sufficiently marked; then dilute until the action is sufficiently gradual to be well under control. In this, as under the former system, the most certain results are obtained with a weak solution, and, provided sufficient attention be given to this point, little trouble will be experienced.

We have now to speak of another plan which appears to offer advantages not possessed by those already mentioned. It necessitates two operations, but differs from the first method described in that the final result is not necessarily dependent upon the extent of the action of the first solution. If the first stage of the process be carried too far the action of the solvent may be stopped when the desired result is reached. For converting the silver in the first stage we use chloride of copper in very weak solution; our reason for giving the preference to this salt will be explained farther on. After bleaching the image to what appears the desired point, or a very little further, it is washed and treated with weak solution of hypo.—not more than ten grains to the ounce. This rapidly clears the image, and when that is done (which is readily seen) the plate is thoroughly washed and treated with alkaline pyro., which reduces any undissolved chlorides to the metallic state, and thus undoes the over-action (if any) of the copper solution. We use the salt of copper because the altered colour of the film it brings about renders the subsequent operation more easy to watch, and we prefer the chloride to the bromide on account of the easy reduction of the former under the alkaline developer, independent of any exposure to light. The action of alkaline pyro. upon an image bleached with bromide of copper is capricious in the extreme, and requires the plate to be re-exposed to light. We must here repeat that it is important to use the solutions sufficiently weak. We have given the strength of the hypo.; the copper solution should not be stronger than one grain to the ounce. This method is more practically applicable to negatives in half-tone than any other we have tried, and is at the same time equally effective for line work.

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MODERN NEGATIVES.

We once heard a well-known photographer, while complaining of the difficulties he experienced in making all things and all hands work harmoniously together in a large establishment, say of his operator—"Oh! yes; he is a very fair operator, but he wants 'go.' He takes the same style of negative, uses the same chemicals, and has just the same set of poses as he had when he came to me half-a-dozen years ago. He does not advance with the day." This speech, coming as it did from one of the shrewdest heads in the profession, struck us as containing a great truth.

There cannot be a doubt that though in the main the chemicals employed are just the same as those in use a dozen years ago—no radical change of any kind having taken place in that direction in the ordinary practice of professional photography, great as are the advantages that emulsion offers—a distinctly-marked change has taken place in the character of the negatives usually put into the printers' hands nowadays. It is most probable that ere long the inertia of professional artists may be overcome, and emulsion negatives be the rule instead of the exception in studio work when their undeniable excellence is brought home fully to photographers, and at the same time thorough proof given again and again of their rapidity and certainty likewise; for professional conservatism is of such a solid nature that it is only by repeated attacks it can be constrained to move even in the path of improvement. The gain that such a change would bring in its wake cannot be too highly estimated. There is every reason to believe that we may yet hope in emulsion processes for exaltation of sensitiveness to a high degree, and this would bring with it such opportunities of instantaneous exposure that at last we should obtain portraits with expression, and one of the great reproaches to our art would thus be removed. This sensitiveness, however, if obtained, would not be the only means of gain.

In large towns there are many studios where relays of operators and dark-room assistants can produce any number of plates ready for exposure; and though a single dark-room hand in wet-plate work may, if he like, turn out twenty-five or thirty plates an hour, the vast aggregate of small studios have only one man to rely on for preparing plates, posing, and developing, and, possibly, printing. Now it is, therefore, obvious that in such places a sitter cannot walk into the studio and have a series of portraits taken the moment he is posed. Either the plate is prepared first, and the operator is hurried in posing for fear lest it spoil, or he poses his sitter and prepares the plate afterwards. In any case there is weariness or fidgetiness produced—the very frame of mind to be avoided in sitting for a likeness. Even in large studios there are many occasions when sitters do not come in the wonted crowds, and many is the opportunity lost of seizing a set of portraits almost ere the sitter is aware, as might easily be done with a camera fitted with a number of lenses and supplied with a roller slide and Warnerke's tissue. This, however, is a picture for the future. It will be realised, we doubt not, some day; but till then we must be content to treat of the routine of the present day.

Returning to our thesis: we may observe that the distinguishing characteristics of the negatives of the present day (apart from their being retouched, which is a subsidiary question) is from a chemical standpoint—their much greater thinness and consequent increased delicacy; and, from an artistic point of view, their increased merit in every way—variety and elegance combined with naturalness of pose, greater display of knowledge in *chiaroscuro* as distinguished from simple light and shade, and, above all, more frequent avoidance of monotony of arrangement whether of pose or lighting. Upon the latter (the artistic phase) we do not intend further to dwell, beyond expressing a natural satisfaction in its progress, which, as journalists, we have always endeavoured to foster.

The increased thinness of negatives calls for some notice, as the difference is so marked between the practice of the present day and that of (say) half a dozen years ago, when retouching was beginning to be recognised as a necessity by *business* men. We shall not be far wrong if we say that retouching has had more influence than anything else in bringing about this change. Before it was adopted to any extent negatives were longer exposed and more fully intensified in order to get rid of those qualities of undue prominence of facial development, and untruthful, because highly exaggerated, representations of inequalities of flesh, texture, and colour. Nowadays, however, every nerve is strained, so to speak, to bring out the utmost delicacy and softness, and to do this the minimum of exposure is given consistent with the production of these qualities, with the necessary result of giving still greater prominence to freckles and markings and facial lines and hollows; for all these can be taken out by the retoucher, or by the most rigid stickler for truth may be toned down to what is really exact representation, though we are really afraid—such is human nature—that few care for such rigid adherence to the facts of the face.

There is another cause to be adverted to in regard to thin negatives, which, however, is of less influence here than in America.

When fumed paper is used negatives of considerably reduced density may be made to yield pictures as rich and vigorous as a very dense negative with ordinary unfumed paper, such as may still be found in the majority of establishments in this country.

Consequent, however, upon this thinness in negatives, which has followed from the desire, exaggerated by the power wielded by the retoucher, to obtain the utmost delicacy and gradation above all things—even force and vigour—is a remarkable change in the general tone, that is, colour, of the prints produced of late years. Formerly a rich purple or purplish-black was the fashionable colour, and that most aimed at by the bulk of photographers. Now such a colour is rarely seen, for it is most difficult to produce from thin negatives; and withal, though delicate and effective, it has not the depth and richness that browner tones give, which, as we have recently remarked, are much heightened by burnishing or hot pressing—a process entirely inimical to blue-black tones.

We conclude our remarks on this subject by saying that, concurrently with the increased thinness of negatives and greater warmth in tone induced, there has been a marked change in the characteristics of the albumenised paper in the market. Which one has influenced the other it is difficult to say, but we are inclined to think that the albumenisers have followed the lead. We allude to the predominance of paper which is not intended to be toned beyond a brown. Some years ago ammonium-salted paper, which gave blue tones, was the rule, and barium-salted, which gave brown, was spoken of as a novelty. At the present time if the various papers in the market were tried we feel assured that it would be found that the majority were intended for other than bluish tones. We commend this observation to those who have noticed, without being able to account for it, a change in the character of an important article of photographic consumption.

INSTRUCTIONS IN THE USE OF WASHED COLLODION EMULSION.

We have so often been requested to give elementary information relative to the method of using bromide of silver collodion emulsion that we have determined to devote the present article to the above subject. We may, however, premise that it is intended only for those who desire or require elementary instruction in this most attractive and convenient branch of photography.

We shall assume that the intending dry-plate worker possesses collodion emulsion which, as it is a commercial production, he has purchased ready prepared. Numerous articles on the preparation of emulsion have appeared in our pages; hence it is beyond our scope at present to say anything concerning its manufacture. The emulsion whose use we are about to describe is that so well known as "Liverpool washed emulsion," the local appellative being derived mainly from the fact that it owes its inception to a Liverpool amateur and experimentalist, Mr. W. B. Bolton, and in a less degree owing to its preparation having been made a speciality by a firm which retains a nominal connection with its birthplace. "Liverpool washed emulsion," by whomsoever made, is, in its most popular form, a preparation which when poured upon a glass plate supersedes by that simple act all baths, washings, and preservatives. We shall now go into particulars, and indicate in what manner the "washed emulsion" may be used so as to ensure a good negative.

The first thing is to prepare the glass. During the last fortnight we have prepared several plates with a substratum and a few without it. The nature and advantages of both we shall presently describe. We greatly prefer working with plates in which a substratum is interposed—in part at least, if not in whole—between the glass and the collodion. That which we like best is a solution of india-rubber in benzole. For certain reasons, but into which we cannot here enter, deluted albumen does not answer well as a substratum in the washed emulsion process. A little white rubber dissolved in benzole leaves nothing to be desired. We make a stock solution of the consistence of thick cream, and sometimes use this of its full strength by running a stiff brush charged with it round the margin of the plate to an extent of about a quarter of an inch from the edge. This dries rapidly, and leaves a border to which the collodion emulsion will adhere with great tenacity. Another method which we sometimes adopt is to dilute with benzole the india-rubber solution, the degree of dilution being so great that upon shaking or pouring out the fluid it presents an appearance as if it contained nothing in solution. When a diluted solution of this kind is made use of the whole of the surface of the plate must be coated, instead of a marginal border as in the former case. The benzole evaporates immediately, leaving a delicate, misty-looking film upon the surface. The third method is to dispense with the use of any substratum, whether wholly or partially applied, and either trust to the "chapter of accidents" for the adhesion of the film during development or, preparatory to development, applying a bit of stiff tallow round the margin, by which the various fluids are prevented from getting to the extreme edge of the plate and thus disturbing the film by getting beneath it. We prefer either of the two first methods to the last of the three. They permit of the development of an image up to the very margin, but when a tallow candle has been applied it cuts off a larger margin than may sometimes be expedient; for when the weather is hot the tallow becomes softened, and more of this substance is left upon the surface than is desirable. For mere experimental work, however, the tallow candle is not only not to be despised, but is gladly utilised as a most useful auxiliary.

If a dozen plates are to be prepared let them be piled one on the top of the other, each with the prepared side downwards; hence, when operations are to be commenced, the back of the plate is upwards. By means of a pneumatic holder a plate is lifted from the pile, and a broad camel's-hair brush is then passed over the face in order to remove any dust that may have adhered to the plate. The emulsion is now applied, and after it has spread all over the surface the plate is held in a nearly vertical position, with one corner at the bottom. After the superfluous emulsion has been drained off the plate is placed on end for a sufficient length of time to ensure the diagonal markings formed in consequence of the former position to merge into each other. Rocking the plate should be avoided, for the film being somewhat turgid in its movements a pause of several seconds in one position is necessary in order to get the emulsion to flow from one ridge to another. All this must, of course, be done in a yellow or, rather, orange light.

The rectangular draining-rack is rather objectionable as a medium for the reception of newly-coated plates; for, unless great care be taken, small bits of the margin of the film are apt to be broken off, which is unsightly to the fastidious eye. If the plates are small they may be laid flat upon a large teatray to dry, the drying being quickened by holding a tray filled with plates over a Bunsen burner or spirit lamp. If the drying has been allowed to proceed partially in a vertical position previous to laying the plates down horizontally there is a danger of drying-marks being produced. We must, however, observe that we have dried many dozens of small plates in this way without discovering drying-marks in more than one plate in twenty.

It is always safe to *back* plates prepared in the manner described. The method we adopt is as follows:—A small quantity of Spanish brown is mixed with water to the consistence of a thick fluid. To this are added a few drops of a solution of gum arabic to give coherence to a film formed by such a mixture, and a small quantity of glycerine to prevent it from drying too hard. It is very difficult to give precise directions, but each photographer will discover for himself the best proportions by the following indications:—If when the backing dries it shows a want of coherence the proportion of gum is too small; and if it be too hard it indicates that the gum is in excess, and must be checked by adding more glycerine. If the substratum take too long a time to dry there has been too much glycerine added, and more water is required to counteract the effect of such excess. One or two trials during preparation will ensure success in determining the best conditions. To use this mixture it need not be painted upon the back of the plate in the thick mass so frequently to be seen on dry plates, but may with greater convenience and equal advantage be applied by moistening a small sponge with water and then applying a "dab" of the coloured mixture on the sponge, which is now rubbed over the plate. This leaves a very thin film, which dries in the course of a minute or two after being applied, and which answers as an anti-blurring backing quite as well as a thick coating. Instead of applying the dabbing brush to the sponge we often apply it to the glass itself with equal effect. When the mixture dries in the jar in which we suppose it to have been prepared, a few drops of water added to the hardened red mass at the commencement of preparations for coating a few plates will soon get it into good working order.

We pass over the exposure, the duration of which must be determined by each photographer for himself according to circumstances. Let it never be forgotten, however, that it is much better to over-expose than to under-expose, because the one can be remedied while the other cannot. If a plate has been exposed for two minutes instead of only thirty seconds the developer can be modified so as to suit this error in judgment; but such modification is not available for under-exposure.

To develope: fix the plate to the pneumatic holder without making any attempt to remove the backing. Next pour over the face of the plate a little alcohol, methylated or otherwise, and which may be applied either unmixed or mixed with water. After a brief period the plate is washed with water, and the backing, being now well wetted, is removed by the application of a sponge, or, if the plate be small, by the finger.

A solution of pyrogallic acid in alcohol, of the strength of a hundred grains to the ounce, is supposed to have been prepared and kept in readiness for use. A small quantity of water having been poured into the developing dish, enough of this solution is added to bring it to the proportion of four grains of pyrogallic acid to the ounce of fluid. Instead of this a four-grain solution of pyrogallic acid in water may be specially prepared. To such a solution we invariably add a homœopathic dose of ammonia; one drop of the ammoniacal solution to be described presently will prove quite enough for two or three ounces of the solution of acid. Another bottle containing a ten-grain (to the ounce) solution of bromide of potassium, and a third bottle containing one part of strong liquor ammonia to ten parts of water, having been provided, the development may be proceeded with.

Upon the plate now wet with the washing water is poured just sufficient pyrogallic acid solution to cover the surface. This is caused to flow over the face of the plate from side to side and from end to end. In a very brief period of time certain features will show themselves, such as the sky in contradistinction to the earth. Details will then appear, but all in such a feeble state as to leave it sometimes uncertain whether the picture is seen by the eye of faith or that of sense. It is, however, to be noted here that if the picture appear with too much fulness over-exposure is indicated, and *vice versâ*. Into the developing vessel should have been poured two or three drops, more or less, of each of the solutions of bromide of potassium and ammonia, and the pyrogallic acid solution on the plate is now poured off into this vessel. At this stage it is necessary to state that if the appearance of the negative, feebly visible, indicates over or even full exposure the proportion of the bromide solution must be increased, by which means over-exposure is counterbalanced; if under-exposure be indicated in the feeble image the bromide must be kept back, for the function of the bromide is to undo the effect of over-exposure and prevent fogging of the image.

When the whole details are out, if the intensity be insufficient an increase in the proportions of the diluted ammonia usually suffices to render the negative of full printing density; but it is safer for a tyro to wash the plate at this stage, and apply a mixture of plain pyrogallic acid solution with a few drops added to it of a ten-grain solution of citric acid and a ten-grain solution of nitrate of silver. Care must be taken that the intensification be not carried too far.

The fixing is effected by placing the plate in a strong (that is, a saturated) solution of hyposulphite of soda, or pouring over it a weak solution of cyanide of potassium.

APPARATUS FOR TAKING AND EXHIBITING PHOTOGRAPHS.

Under the above heading Mr. Wordsworth Donisthorpe has patented (provisionally) certain improvements in apparatus for taking a succession of photographic pictures and for exhibiting such pictures. The following is the specification:—

This invention has for its object to facilitate the taking of a succession of photographic pictures at equal intervals of time, in order to record the changes taking place in or the movements of the object being photographed, and also by means of a succession of pictures so taken of any moving object to give to the eye a representation of the object in continuous movement as it appeared when being photographed.

In order to obtain a succession of photographic pictures I construct the camera to receive a number of prepared plates one behind the other, and by machanism I cause the series of plates to move forward progressively, in such manner that as soon as the foremost plate has been exposed for the required length of time the whole series moves forward a distance; the foremost plate, which had previously been exposed, is then allowed to drop or is carried downwards into a receiver below. The plate which then occupies the foremost position is in its turn exposed to the light passing in through the lens of the camera, and after being exposed is similarly deposited in the receiver, and so on in succession until the requisite number of plates have been exposed.

The admission of light to the lens is controlled by a movable screen which is moved away when one of the plates is in position for having light thrown on to it by the lens, and is brought in front of the lens whilst the plates are being shifted from one position to another. The mechanism for moving the plates and for moving the screen is driven at a uniform rate, so that the plates are exposed one after the other at uniform intervals of time. The plates, after being exposed in the camera and carried away by the receiver, are afterwards developed and set, and prints may subsequently be obtained from them in any ordinary manner.

Apparatus arranged as above described may be employed for obtaining a record of the movements of or changes taking place in any objects, and may be used either for photographing objects direct or in conjunction with microscopes or telescopes. If the apparatus be arranged to take the succeeding pictures at sufficiently short intervals of time they may be printed at equal distances apart upon a continuous strip of paper, and this paper, with the whole series of pictures upon it, may be used in the instrument known as the zootrope or phenakistoscope. To allow of this the strip of paper may be wound on to a cylinder, and be unwound from it at a uniform speed on to another cylinder, and so carried past the eye of the observer, any ordinary means being used for ensuring that each picture shall only be exposed momentarily to the observer. By this means the movements made by a person or group of persons or of any other objects during the time they were being photographed may be reproduced to the eye of the observer.

It is to be regretted that Mr. Donisthorpe has not given a detailed description of the mechanical means by which he proposes to remove the plate that has just received its exposure, and to substitute for it the next in rotation. Those of our readers who are familiar with, or have read our description of, Cook's patent camera, are aware that this system of rotation of exposure formed the leading idea in that camera, and which, we take occasion to say, was most ingeniously carried into practical execution.

ACTION OF NITRIC ACID ON BROMISED FILMS.

I have been attempting an enlargement by the nitric acid treatment of a bromide film, and have tried the hydrosulphite developer for obtaining the positive in the camera. I have succeeded in getting a good positive—that is, if it had been fixed in hypo.; but, wishing to obtain a negative, I flowed diluted nitric acid over the film, with quite an unexpected result—the film became clear all over, with the exception of some of the highest lights of the positive, where the bromide still remained. To the sense of sight there had been plenty of unaltered bromide in the better-lighted portions of the positive.

I then washed the plate, which showed stains; and at one point, near the edge, were traces of an image of a rusty colour, apparently unacted on by the nitric acid.

I now applied an aceto-nitrate developer, thinking that, though all the reduced silver would be dissolved, some invisible bromide might remain. But here again I was mightily mistaken; for I developed a *positive*, as before, with very considerable ease, the traces of an image of a rusty colour gradually merging into the resuscitated image, which was, also, ruddy in colour, but became browner as the development or intensification progressed. Now, I should like to know why the nitric acid made such a nearly wholesale clearance of the image. Surely it is unusual to find the same bromine compound soluble in both nitric acid and hyposulphite of soda, for this would have been the case had the latter been applied. If the unreduced bromide had been composed of sub-bromide of silver I believe it is not likely that nitric acid would have had much action on it; and, if it had been so, it would not appear to have been formed by the action of light, as the plate was left over an hour in the developer, and in such case should be reduced.

I think it may be worth while to refer you to the eighth and ninth paragraphs of a paper on *The Latent Image*, at page 387 of the volume for 1874, by the late Mr. Thomas Sutton. He there points out that, though *reduced* silver (?) may partake of the *same appearance as silver bromide*, it is still, nevertheless, entirely soluble in nitric acid.

It is, also, interesting to find that those parts of the film which had held the reduced silver before the action of the nitric acid again took on silver in preference to those parts which might contain (theoretically) some silver bromide *in statu quo*.

I was aware that it is possible to bring out an image from a plate treated with nitric acid, this peculiarity having been known for many years. It is very curious that it should be so. I wonder whether a trace of some substance insoluble in nitric acid is left to form the nucleus for the precipitation of fresh silver. I cannot think that pyroxyline, having the same chemical composition all over the film—or, more strictly speaking, pyroxyline uncontaminated by any other ingredient—is, through some molecular disturbance at certain parts, able to attract fresh silver.

The plate was one prepared with Liverpool emulsion, and—at least I supposed so at the time—was sufficiently washed free from the developer before the acid treatment. I do not think there would be any difficulty in obtaining printing density with Liverpool plates if the formula I have lately published for the hydrosulphite developer be used, and this without any organifying previous to development. The colour will probably be chocolate brown.

Herbert B. Berkeley.

P.S.—I believe that I am correct when I state that the latent image is destroyed by nitric acid, and cannot be brought out by any developer. This being so, it would appear that the pyroxyline is modified in some way, receiving an addition, or parting with a component, *during the development*, this gain or loss, as the case may be, rendering the parts affected liable to attract silver in the act of deposition—not that the action of light setting up that "molecular disturbance," sometimes reverted to in connection with the latent image, is the cause.—H. B. B.

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UPON THE ACTION OF PIGMENTS AND COLOURED GLASS UPON STAINED SILVER BROMIDE.

The fact, observed by me, that certain substances, such as the aniline dyes, added to white bromide of silver increase the sensibility of the latter to the yellow, red, and green colours of the sun's spectrum has often given rise to the assumption that it must be possible, by the same means, to obtain photographs of oil paintings and other coloured objects in which their natural proportions of light and shade shall be preserved. As of late many questions have been put to me on this subject, I shall permit myself to repeat the explanation I gave in 1874 in *Poggendorff's Annalen*.

The idea that the chemical action of ordinary pigments or coloured glass is analogous to that of the spectral colours is an error widely spread in the scientific and photographic world. Though well aware that the colours of the pigments are never pure, one still believes himself justified in assuming that the action of the pigment colour will correspond with that of the colour which to our eyes appears the dominant colour. Seebeck, Suckow, A. Vogel, and Döbereiner observed that certain chemical actions of light—such as the formation of muriatic acid from chloric acid, &c.—does not take place under red glass, though it does under blue; and the results of modern photography—which often represents blue stuffs as white and green, and yellow and red very often as black—apparently support the old idea. I have, however, already by a table of colours shown by photography itself that this view is by no means generally applicable, and that certain yellow and red pigments—such as Naples yellow, light ochre, and madder—have rather a strong action, and certain blues, as Berlin blue and indigo, but a slight action upon photographic plates, thus directly reversing the action of corresponding spectral colours. This appearance may easily be explained as due to the optical composition of the component colouring matter.

Still more glaring, however, is the difference between spectral and pigment colours when one uses bromide of silver or chloride of silver plates, sensitised for spectral yellow or red, for taking a scale or table of colours. If one bears in mind the difference in sensitiveness between the different silver salts, and chooses the appropriate length of exposure, then almost the same result will be got whether one uses silver chloride, bromide, or iodide, and whether one works with or without staining the plate; that is to say, that certain sorts of blue—such as ultramarine and cobalt—act like white, and certain sorts of red or yellow—as chrome yellow, red lead, and cinnabar—act like black. Even the bromo-iodised silver, most intensely sensitive to a spectral green, with a *short exposure* is not removed from this influence in the taking of green pigments and leaves, since a scale of colours taken with pure iodised collodion furnishes as powerful an image of the green as bromo-iodised collodion would under the same circumstances. It is only with a *very long exposure* that the favourable action of green upon bromo-iodised silver is distinctly observable. Practically one may, therefore, assume that with wet bromo-iodised silver plates the action of the colouring pigment is really dependent upon the quantity of spectral indigo and violets contained in it. It would, consequently, seem to be certain beyond a doubt that, by using a chloride of silver plate stained with naphthaline—which is as sensitive to spectral yellow as spectral blue—a distinct action of the yellow pigment must be produced; yet this is only the case to a slight extent. The thing is easily explained when one bears in mind the *relative clearness of the spectral colours*, which has until now been left completely out of sight in judging of the comparative action of spectral and pigment colours.

Vierodt has lately determined the relative clearness of the separate parts of the sun's spectrum, and gives the following figures as the comparative actinic strength of the separate parts:—

In Red line B.	In Orange line C.	In Yellow line D.	In Yellowish Green between D and E.	In Green line E.	In Light Blue line F.	In Dark Blue line G.	In Violet line H.
2	12	78	100	37	12·8	0·8	0·07

According to this table the proportion borne by the clearness of the spectral blue at line G is to the spectral yellow at D as about 1 to 100.

No such relative proportion is, however, shown between the clearness of any blue to any yellow pigment. An intensely bright chrome yellow will scarcely appear more than four times as bright as a dark ultramarine, and a plate which was, accordingly, only made as sensitive to spectral yellow as to spectral blue (though the first is a hundred times as clear as the last), will, therefore, in the time it is powerfully affected by the ultramarine blue, scarcely have received any impression (in the given case it would be twenty-five times weaker) from a neighbouring chrome yellow that only appeared four times as clear as the blue. If it is, therefore, wished to equalise the action of the yellow with that of the blue, one must either expose through a suitable yellow glass, which will soften the blue rays, or still further increase the sensitiveness of the preparation for yellow. The results got with stained silver chloride justify the hope that this is possible.

Provisionally only a few dyes have been tried; but these experiments have placed the fact of the photographic action of absorbing mediums beyond a doubt, and with more extended experiments it will be easy to find dyes which possess in a high degree the required properties. Only those dyestuffs, however, may be used which are not changed by the photographic chemicals, and which have a favourable effect upon the photographic process of reduction.

—*Mittheilungen.* H. Vogel.

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NOTES FROM AMERICA.

Journalistic Courtesy, Individuality, and Personality.—Burnishing Prints.—Cleaning Daguerreotypes.—Skylights and Side Lights.—Effects of Acids and Alkalies on Glass.—Washing of Prints.

Mr. J. H. Fitzgibbon, whose racy journal, the *St. Louis Practical Photographer*, for July is before us, gives us a friendly dressing for allowing our correspondent "Free Lance" to exceed the limits of journalistic courtesy in endeavouring to turn a laugh against the *Practical Photographer*. Being sincerely desirous that every side should be properly represented in cases involving differences of opinion, in justice to the energetic editor of our youthful American contemporary we gladly make room for his comments upon the reception he has met with in our pages. These are as follow:—

When we entered the lists as a photographic journalist it was with the intention of doing unto others, not as we were done by, but as we would that they should do unto us. We were met at once by a kindly greeting from all but one of our contemporaries—the *Philadelphia Photo-*

grapher—both here and in Europe, and were welcomed with an outstretched hand, which we (figuratively speaking) grasped with equal pleasure and cordiality. Thus far we have no serious objection to raise to our treatment; it has been pretty much what we expected, and we do not complain. Our English contemporary, THE BRITISH JOURNAL OF PHOTOGRAPHY, for April, indulges one of its contributors, "Free Lance," in a few flings at us, which it seems to us must have been accepted by the editor on the reputation of his correspondent; for, certainly, if he had read the communication he would have returned it for correction. John Bull is very jealous lest anyone should pretend to speak or understand the English language except himself, and this critic on our humble self takes the pains to hold us up to ridicule for our classical attainments, &c., and proceeds to give extracts from our writings, to turn the laugh upon us. Now, we plead guilty to being simply a plain, common American, such as most of our fellow-artists are; but we do think our friend "Free Lance" could profitably take a few lessons in criticism from the humblest of our fraternity. We know the class of men we have to write for, so we use plain English, which appears to be beyond the comprehension of such highly-educated Englishmen as "Free Lance." We wrote :—"We find a mean spirit of jealousy trying its very best—with the might of a ninny—to stop its growth (that is, the Lambertype, in all its variations), and throw frozen water, as it were, on and around its wheels of progress, and stop its course till its maw is stuffed." "Free Lance," who assumes the duty of senior wrangler, proceeds to dissect our composition, and defies any one to show anything to surpass this, "the maw of the wheel of progress." Well, we will join in the challenge; but, then, we ask the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY to notice that this idea is not ours, but "Free Lance's." We wrote of a "spirit of jealousy" (known in this country by the cognomen of the *Philadelphia Photographer*) which was opposing the carbon process, and it was this "spirit of jealousy" whose maw we alluded to. We defy "Free Lance" to find in *our* composition any such idea as "the maw of the wheel of progress," and what we object to is his trying to foist upon us this monstrosity of his own begetting. Now, friend "Free Lance," will you allow us to ask by what right you presume to criticise and hold us up to ridicule? What do you know about us? *You never saw our journal*—we have your own authority for the statement—yet here you are putting forth your own ideas and trying to foist them upon your readers as ours. Would it not have been more manly, more honest, to have withheld your criticisms until you had at least *seen* our journal? and still better to have waited until your leisure permitted you to "read, mark, learn, and inwardly digest" its contents before allowing the long ears to peep out through your gay caparisonings? After this, if you will be guided by the American axiom, "Be sure you're right, *then* go ahead," you will be less likely to make such a blunder as you have in this fling at our classical attainments. Somebody in *Notes from America*, in a May number, too, must have a fling at us about our jokes. He cannot understand them very well—that is not our fault; but, like "Free Lance," he has fallen into the error of crediting us with the originality of something not ours. "Didn't I told you so?" is not an Americanism—it is a pure John Bullism. The balance of the quotation is a simple statement which our contemporary at Philadelphia most thoroughly understands, and there is not a photographer in the United States or Canada who needs any explanation of it; but as you are not so well acquainted with us we will, for your information, state that the joke was from a correspondent who assured us if we would send a copy of our journal to a certain party he would drop the old, unreliable *Philadelphia Photographer*, and take the new, live, spicy *St. Louis Practical Photographer*. We sent him a spare copy to use as he saw fit, and received a letter containing a year's subscription and the joke you could not comprehend. The beauty of it is, we have had so many such jokes that while pleasing us and filling our treasury we have no room to spare for them, so we do not insert them now. Our friend will please accept our thanks for the very flattering notice he gives us in his next paragraph, which shows that he, unlike "Free Lance," read our journal before writing about it.

Having thus presented to our readers Mr. Fitzgibbon's sentiments on the above matters, we close our notice of the subject by observing that we are much pleased with the individuality displayed in the management of the *Practical Photographer;* but let it be understood that we are not unacquainted with the distinction between individuality and personality.

So far as we recollect, the formula recommended in this country for preparing a lubricant for photographs to be burnished consists in dissolving a small quantity of Castile soap in alcohol. Lubricators in America, the birthplace of the practical burnisher, have been subjected to modifications. The editor of the *Practical Photographer* says :—

> We have got good effects by making a pasty mass of fine white wax and ether; this we spread on the woolly side of long-nap Canton flannel, and rub the picture with it. Care must be taken not to have too much on the cloth, else some will get on the back of the card and stain it. A cloth properly prepared will lubricate a great number of prints, probably two hundred. Another very good plan is to procure a piece of white soap (glycerine or cocoanut oil soap), rub a piece of Canton flannel on this until it is coated, then rub the print evenly, renewing the soap on the cloth as required. Another way is to dissolve wax in alcohol, and apply with a broad, flat camel's-hair brush. The alcohol dissolves very little wax, but very little is required. We have done very fine burnishing with alcohol and glycerine applied with a flat brush. The formula is alcohol, eight ounces; glycerine, two drachms; essence of wintergreen, forty drops. This gives a pleasant perfume to the cards, yet not offensively strong. The temperature of the burnisher has a great deal to do with the effect. Try a print when the planisher has just reached boiling heat and the feed roll is comparatively cold; then let the heat be increased as high as possible without blistering the print, run a print through a few times, and "compare effects." *That* is the true test. If kerosine is used as a heater it is difficult to get a proper degree of heat, and there is great danger of smoking. If alcohol is used "sweating" is certain, except in extremely warm weather. Before applying the alcohol lamp see that the planisher is lowered at least an eighth of an inch; a quarter of an inch is better. It must be sufficient to prevent the water which condenses on the feed roll from touching the polished surface of the planisher, because wherever it does so a spot is produced with a rough edge, which must be polished off to avoid scratching the print. To polish, take a piece of *soft pine*, about an inch wide, and thin enough to run between the planisher and feed roll; pour on a few drops of olive oil, sprinkle with flour of emery, and rub the planisher lengthwise *from end to end*. Two things are important: it must be *flour* of emery, and the stroke *must not be short*, but must go the full length of the planisher. Wipe clean with a cotton cloth, and with or without a lubricator you may go on with your burnishing fearlessly, unless you have used an acid in the previous manipulation, in which case a lubricator is an absolute necessity. No amount of burnishing will make dull, mealy, or half-washed prints look well.

We have on numerous occasions given directions with regard to the cleaning of daguerreotypes that have become stained by the action of the atmosphere. Our instructions have invariably been to wet the surface with water, then to apply a solution of cyanide of potassium, by which the stains and discolouration would be removed, following this by a quick washing—first with plain water and then with distilled water. From an article on this subject in the journal from which we have already quoted it seems that Mr. Fitzgibbon lays special stress on the value of the application of *hot* water as a preliminary wash. Here is what he says :—

> To clean daguerreotypes *perfectly* many ways have been published, and many daguerreotypes have been spoiled beyond redemption by so many ways being tried by so many who did not understand cleaning them. If the photographer, or even the old daguerreotypist, follows the following instructions closely he never will injure one, but clean it perfectly, so that it will be as brilliant as the day it was taken, if it has not been defaced by rubbing the surface of it. First, *all* films, spots, and chemical action can be removed by the following method, and by no other than I have seen published or heard of. Now, bear in mind the secret is *hot water;* where it should be used I will state. Second, when a party brings a daguerreotype to you to copy, or restore (as they call it), if there are no defects on it carefully take it apart, and brush the surface with a fine camel's-hair brush crossways the *position* of the picture—never up and down; then copy it. Third, if there is a film of some or all colours of the rainbow, spots, or stains on it, have ready some *hot water*, cyanide, a pair of pliers, spirit-lamp, and some distilled water. Next, proceed as follows :—First, see that the water is filtered and clean, cyanide also; brush as directed above; then take hold of your plate with the pliers, pour on the *hot water first*, leaving it on the plate for about a minute, more or less; that softens the film of imperfections that is on the daguerreotype plate or picture. The *hot water* is the whole *secret* of cleaning, with the other things mentioned. Cold water may do, and may not, as I have often found out, but hot certainly will. Next, pour the hot water off and pour on the cyanide solution, and it will immediately eat off all imperfections; then wash the picture and it will become as brilliant as when it was first taken. As soon as the imperfections disappear, which will be in a few seconds, pour off the cyanide solution, and rinse the plate well with distilled water.

In an article devoted to the construction of studios, with respect to their lighting, Mr. R. J. Chute gives to the readers of the *Philadelphia Photographer* his ideas on this all-important topic. He says :—

> The light is the most important feature of a photographic gallery, and yet it is the one in which the most mistakes are made in construction. Too often, however, the photographer is the victim of circumstances, in that he is obliged to conform to some condition of the building, such as its situation, its surroundings, &c., which he knows to be unfavourable for his light, and which will put a severe tax upon his skill to ensure success. Then, again, there are others who go to work with everything in their own hands, and construct the worst kind of a light that human ingenuity can devise. But photographers are coming to a better understanding in regard to lights, and many inquiries during the past spring show them ready to accept what has been proved to be

> the best. A photographer is sometimes deterred from locating in business because he cannot find a light or locality to suit him. This is well; it is better to be cautious than reckless, and yet there is not much risk if one has the ability to adapt himself to circumstances. In lieu of a skylight a high side light may be used till a good skylight can be secured or built. Having had some recent experience in fitting and working a high side light I was much pleased with the results secured by it. It was about twelve feet square, and situated due north. I ran a blue, opaque curtain across the bottom, so that the top of it was about four and a-half feet from the floor. Above this were two breadths of white muslin curtains, running on wires so as to be readily adjusted to the requirements of the light or sitter. On the shadow side I placed a screen of a light neutral tint, which being moved near or far from the subject produced the desired effect. In addition I run a white curtain on a wire across this side screen, at about the height of the sitter's head, for the purpose of lighting up dark or tanned faces. This light for single heads I found to work remarkably well, producing negatives as well lighted and of as fine modelling as could be produced under most of the combination lights. But, remember, I do not advocate such a light for all work, or advise any one to adopt it for a permanency; but photographers are often out of business, or looking for locations, and as side lights are more readily found and fitted than skylights, it would often be better to locate temporarily with the former, till a suitable light can be found or built, than do nothing. The combination, or top and side light, is the best adapted for all work, and no photographer should think of locating permanently without the very best light he can secure. The most common error in skylights is the height. In many cases this is from choice, as high lights have their advocates, who sustain them from theory rather than from practice; in many others it is from necessity arising from the construction of the building, which cannot be altered. But a photographer had better reject a location altogether than accept it with an unfavourable light, for success depends upon that more than upon any other part of the gallery. The loss of light, which is the principal objection to a high skylight, may be compensated for by making the light proportionately larger. As, for instance, suppose a light sixteen feet square and eight feet high above the head of the sitter: the latter would receive the same amount of light above an angle of forty-five degrees as under a light twenty-four feet square and twelve feet high; but place the sixteen feet light at the height of twelve feet, and there will be a loss of fifty per cent. in the amount of light admitted to the sitter. Thus it is clearly to be seen, as all practice proves, that a high light will work slow compared with a low light of the same size. But, as there are many high lights in use, the successful working of them depends much upon the arrangement of screens and the methods of operating. I have recently had occasion to work under one of these high lights, and a little talk about it may not be without interest. It is a combination top and side light, but the latter is so obstructed by a building opposite that it is mostly a top light. The lowest part of the top light is fifteen feet from the floor, and the highest more than twenty. To make this manageable I placed a series of curtains of drab cambric just high enough to clear the backgrounds. They are hung on wires running across the room, and are low enough to be easily manipulated with a short rod, thereby dispensing with all cords and pulleys. On the side light a curtain of the same drab material covers about four feet of the lower portion of the light, and above that are two breadths of curtains which extend high enough to meet the curtains on the top. Just above the top curtains I arranged several frames covered with white tissue-paper. These are for use when the sun shines, and may be slid away from under the light when not wanted. With this arrangement fine effects may be secured, though it is difficult to get quick sittings, even by opening the full light. It is only one more argument against high lights, and I trust that photographers who may contemplate reconstructing or building a light may learn the lesson beforehand, and not when it is too late regret that they built their lights so high.

On all subjects connected with glass, especially as that body is influenced by the agencies of time and light, Mr. Thomas Gaffield, of Boston, whose contributions to this Journal will be fresh in the minds of our readers, is an acknowledged authority. A querist in our Philadelphia contemporary who asks—"Do strong alkalies or acids have a deleterious effect upon glass?"—has elicited from this gentleman a reply to the question thus propounded. Mr. Gaffield says:—

> In a general way we may answer that no alkali has any effect on well-made glass, and no acid except hydrofluoric acid, which is consequently the only one which can be used for etching purposes. In our chemical laboratories all acids and alkalies are kept in glass bottles, except the hydrofluoric acid, which requires vessels of lead or gutta-percha. But if glass be made in an imperfect manner, either from too great haste in melting or from an excess of alkali in its composition, the action of the atmosphere alone, in connection with the affinity of alkalies for moisture, causes an efflorescence of the uncombined soda or potash, sometimes furrowing the surface in an infinitesimal manner, creating an iridescence, and sometimes disintegrating it in such a way as to produce all the appearance of ground glass. The natural surface of any glass is undoubtedly its strongest portion, and when that is removed, by grinding on the wheel or by hydrofluoric acid, the strength is materially diminished. Now, if the surface of an inferior glass is disturbed in any degree by the action of the atmosphere, as before indicated, or by contact with alkalies or acids, as suggested by your correspondent, just in that degree will it be weakened in strength. I suppose that most of the sheet glass sold for negatives is strong and well made, and not seriously affected by the removal of the films and subsequent cleaning. Of course there are some exceptions, as it is difficult to achieve perfection in any manufacture, and it would seem that your correspondent has found by experience that his old negative glasses break more easily than new ones that have never been used, and therefore may not be of the best kind. It may be interesting to remind your readers that cases have occurred where the removal of collodion or gelatine films has carried away also a thin film of the surface of the glass itself. This, of course, would destroy or seriously deteriorate its strength and value. It would be quite interesting to hear of the experience of other photographers on the point of the strength of negative glasses after being in use several years. It is possible that a multiplication of experiments, and a scientific examination of the subject, may prove that a long exposure to sunlight may not only change the colour of our glasses, but involve such a physical change in the molecular structure of the glass as to materially weaken its strength. It may be such a change as this, rather than the use of acids and alkalies, which weakened the glass of your correspondent after long usage and exposure to sunlight in making his negatives. This idea, however, is only a momentary thought of the writer, which is not to our knowledge suggested in any treatise on glass, and may not, after careful examination, be found to be sustained by any facts or reasonable theories.

Mr. John L. Gihon, in a communication to the same journal, lays great stress on the importance of washing prints separately and rapidly in changing water rather than allowing them to lie soaking for many hours in still water. He gives the following outline of printing proceedings connected with the Centennial Photographic Company, the large amount of work executed by which company made it imperatively necessary that the most rapid plan should be adopted that would at the same time assure a perfect result. He says:—

> There were young men attached to the place whose duty it was to attend to this department only, and if they were at all conscientious in the performance of it the photographs must have been more than usually well-cared for. From the soda dishes the prints were removed to be placed in others containing a moderately-strong solution of salt and water. They were allowed to remain in this for a few moments. The efficacy of salt in preventing the dreaded and much-talked-of blisters was pretty thoroughly proved. I do not know that any inconvenience was occasioned by their appearance. I refer, of course, to the small, pimply varieties that you have seen. Those big, swollen-up fellows which occasionally puff themselves into existence, that remind one so forcibly of the action of cantharides upon the human skin, I believe to be incurable though, fortunately, seldom-occuring evils. They, doubtlessly, are originated by faults in the paper itself, and depend upon the want of adherence of the albumen. A print showing them had better be discarded at once, for it will only be a source of vexation, no matter how carefully you endeavour to doctor it. Along the wall there was a line of tanks plentifully supplied with running water. From the salting bath the pictures were "dumped" into the nearest of these, and, after some washing and changing, gradually came into the hands of the attendants who did the "squeezing." Batches of a dozen or more were carefully placed between the folds of a pure rubber cloth and pressed, first one way and then another, by means of india-rubber rollers mounted in a convenient handle. This, of course, was claimed to be *the* important part of the work, and after its accomplishment little after-washing was deemed necessary. It was found that by giving constant care to the matter all traces of soda could be removed in half-an-hour. Although there is a rolling arrangement sold specially for the purpose, impromptu devices can easily be made. A housekeeper's dough-pin would answer admirably, if well covered, and even broomsticks might be made to do duty. Should you desire to test for any lingering traces of hypo. I know of no more simple method than was suggested by an English photographer years ago. He claimed that he could detect the presence of one part of soda in one hundred thousand parts of water. His biography not being accessible, or maybe not even published, I cannot tell you if he were a homœopathist. The instruction is simply to draw off into a narrow, tall bottle, or graduated measure, a half-pint or more of the final wash-waters of the prints. Allow the liquid to become perfectly still, and then let fall into it a single drop of a strong solution of nitrate of silver. The latter will fall to the bottom, causing an opalescent cloud, which, if free from hyposulphite of soda, will remain perfectly white, while if the slightest trace of the hypo. is present it will speedily assume a darkened tint, the depth of colour depending upon the amount present in the water under examination. A little practice soon accustoms the eye to these delicate changes of hue. There are many hundreds of men in our business who cannot afford the

time required for the constant handling of pictures whilst washing, and who have not competent assistants whom they can depend upon for the proper performance of their duty. In such cases it is better to have a tank that will mechanically do its work as perfectly as possible. The description below gives an idea of an apparatus that I have had introduced into several leading establishments, and that is at present used by myself. I know of nothing better. Modifications of it have been published from time to time in the *Philadelphia Photographer*:—The size of the apparatus must depend altogether upon the amount and character of the printing that is done. It is a circular tank, made of galvanised iron. The upright portion of the sides is not made perpendicular, but inclines inwards towards the top. The object is to aid in preventing the pictures from adhering to the vessel. The real bottom of the contrivance is a conical or funnel-shaped affair; and perforated with holes is a false bottom, easily removable for cleansing purposes, by reason of its being constructed in adjustable sections. From the main supply-pipe there are two branches. The one constitutes a shower-bath that can be used at discretion. The other runs around the entire circumference of the tank near to the false bottom. Its entire length is punctured with holes, and the little streamlets force themselves up instead of down upon the moving pictures. There is a syphon that can be allowed to act at discretion. By its use the prints can be drained almost dry every fifteen minutes. Then there is the usual waste-pipe and an overflow. Should the syphon be kept in operation the stopcock should be closed. Otherwise, if the syphon should not be used, then the stopcock should be turned so that somewhat less water escapes through the overflow than is supplied. The overflow will provide against any danger of an accidental flooding of your room. The advantage of the cone-shaped bottom is that all the water contaminated with dirt, hypo., &c., will naturally sink below the level of the prints. I can conceive of nothing more admirably suited to the purpose. Where there is a plentiful supply of water (few galleries lack it) the photographs should be as thoroughly cleansed as it is possible to make them. Even the drying off of the prints has exercised discussions, and there are now advocates of more than one method. Those who use Slee's prepared mounts need not be much troubled about the matter, because the prints (provided they have been trimmed) can be taken directly from the water and pressed to the cards. The cutting of a print after it is removed from the pressure-frame, and before it is toned, cannot, I think, be too strongly advocated. There is every reason in favour of the plan, and none against it that I know of, except an occasional plea of want of time. I was myself much prejudiced against so flagrant an innovation upon time-honoured customs until observation and an experience as to the economy of the measure made me realise its advisability. The clippings from the edges of prints, no matter how inconsiderable they may be when singly considered, become really valuable when weighed by the pound. The pennies that are inconsiderately thrown away would be the making of dollars if gathered together. No smaller an item is the economy of gold in the toning process, and, contrary to the preconceived ideas of the uninitiated, there remains the lessened liability of damage to, or the tearing of, the print during its manipulation. The clear-cut edge is a great protection to it. Otherwise, if it is desirable to dry off your pictures before mounting them, it is necessary either to hang them up, to lay them upon covered stretchers, or to place them between heavy blotters or cloths. The last plan was the one most generally adopted by the company. It had the advantage of preserving the pictures well straightened out, and thus rendered more adaptable to the Robinson trimmer or Bergner cutter. Care must be taken that the blotting-papers or cloths are kept scrupulously clean; an occasional test might be used for the discovery of any trace of soda contained in the former, and the latter should be washed frequently. It is often averred that the blotting-pads as they are received from the paper-makers or stationers are already contaminated by soda used in their manufacture. Frequent experiment has, in my own case, failed to detect its presence.

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PHOTOGRAPHY AT THE WAR.

My voyage from Turkey in Europe to the Sweet Waters of Asia proved to be a stormy one, for by the time I reached the other side the boat, which was a dug-out, was partially filled with water; but I managed to preserve my apparatus by wrapping it in one of Woolgar's mackintosh coats. I would recommend every traveller in the East to provide himself with one of these coats, as they are impervious both to damp and heat.

It required the assistance of some half-dozen stalwart Turks to secure the boat to the pier before I could land. This desirable end obtained, I found that my apparatus had not suffered, but *I* had, being thoroughly wet; however, by the aid of the sun one soon dries up.

The Sweet Waters of Asia is a river running through a beautiful valley and falling into the Bosphorus. Here is a palace of the Sultan, situated on one of its banks. Of this I secured a view. The light is now *apparently* intense, being past midday; but this is not really the case, as an Eastern sunlight is very non-actinic, therefore an exposure with dry plates for fifteen minutes I did not consider too much with a wide-angle lens, full aperture. The trees here are very black in the shadows, and mostly of a very dark green. This, as every photographer knows, under any circumstances necessitates a long exposure.

Those who use the roller slide must be perfectly certain before exposing that the tissue is rendered quite tight and flat by the action of the screws, or it will possibly damage the edge or tear it right across, as it did in my case. One of Howard's tents, which may be carried in the pocket, is invaluable for again joining the tissue. An excellent adhesive medium is made by dissolving gelatine in alcohol to the consistency of a jelly. With this, and with the aid of a brush and some vegetable tracing-paper, the tissue is again joined and ready for work—of course, cutting the two edges perfectly straight at the next number; this will only take a few minutes.

Wandering about from point to point and taking other views I hire another steed, as the villages do not present suitable subjects for the camera. I ride a considerable distance inland, and here I come across my old friends—the stones and the mud; but this time I have the greatest difficulty in keeping out of the range of the lens the interesting youths of the village. The subject is well lighted, and there is an absence of trees with plenty of rocks, so I determine to give ten minutes.

During the operation my horse, after smelling about quietly, trotted off in the direction from which we came, considering, no doubt, he had done his duty in landing me on this spot. He had no sooner decamped than the butcher and the baker, and other tradesmen, with my friends the boys bringing up the rear, started in pursuit. Having received an invitation from a Turkish gentleman to partake of coffee and cigarettes I gladly accepted the offer, being without any myself. By the time I had discussed the coffee and finished the cigarette, my captive steed was brought back in great triumph, so I once more slung my apparatus and mounted, and rode off amid the shouts of the inhabitants.

I passed a most interesting point, being a small mosque—of course with the attendant minaret—that was once a Greek church, and contained some fine Christian mosaics. I tried to dismount, but my horse positively refused to come to anything like a standstill, and persisted in describing eccentric circles. This going on for some time, and not a soul to come to my assistance, I was compelled to give up work here and ride on. Spurring on I sighted a village in the distance which seemed picturesque, being situated in a valley, with a river and an ancient bridge and a background of tall dark cypress trees, which invariably denote a cemetery. As a rule the cemeteries are in a most filthy and disgusting condition; but still they impress the beholder from a distance with solemnity. Some of the tombstones are decorated with blue, gold, and red, and contain long inscriptions detailing the virtues of the departed.

It is now about 3.30 p.m., and still as bright as when I started from the shore. I exposed for another picture—this time with the rapid rectilinear lens, full aperture, for two minutes. This is twelve times the exposure recommended by Mr. Warnerke's instructions. I now regret greatly that having taken a number of pictures I am quite in the dark as to what they will turn out, and wish with all my heart I had provided myself with the necessary chemicals for development, as it would be more satisfactory to know what I am doing, and I should recommend that no one should leave England without them, as it is quite impossible to procure such things in the East of sufficient purity.

Finding the sun getting low, I refreshed the inner man in a more satisfactory manner than I had done at luncheon, having discovered at last some Bass's ale. To this I was compelled to point, as the people here do not speak French or English. There was only one thing in connection with the beer I could have wished—that they would not shake it up like ginger-beer before opening. I now determined to retrace my steps; but after having ridden some five miles I found I had lost my way. EDWARD POCOCK,

Artist for the London Stereoscopic Company.

P.S.—In my article of last week I notice two press errors. For "Beleck" *read* "Bebeck." For "let no man induce you to take bank notes to Turkey for any amount," *read* "let no man induce you to accept Turkish bank notes."—E. P.

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EDINBURGH PHOTOGRAPHERS' HOLIDAY.

The annual holiday under the auspices of the Edinburgh Photographic Society took place on Thursday, the 12th inst. The arrangements, as usual, were undertaken by the outdoor committee. With one or two exceptions the whole of the principal studios in the city were closed. As was to be expected in the case of a class which enjoy so few holidays during the summer season, many went off to visit friends or on trips of their own; but the great feature of the day was, as usual, the general excursion, which on this occasion was to the frequently-visited Almond Dell, and which, as before, was reached by canal.

The canal, which in pre-railway times was one of the great highways between Edinburgh and Glasgow, is now almost disused, but is still kept in perfect order. It runs—at least as far as the beautiful Almond Dell—through a fine tract of country, and is, especially at this season of the year, with its grassy banks and their profusion of wild flowers, backed by hedges of hawthorn, dog-rose, and sweetbriar, one of the most charming routes by which a journey can be made. The swift boats—so called because they did the journey in twelve hours—have, of course, long ago disappeared; but an ordinary barge, aided by an awning, a few yards of gaily-coloured calico, and a liberal display of bunting kindly lent by Messrs. Knox, Samuel, and Dickson, makes a very good substitute.

The weather, which had for some days been disagreeably wet, looked somewhat threatening; but photographers have faith in their friend the Sun, who has never yet failed to shine on their annual holiday, and so by a little after nine o'clock the whole party were on board. Under the direction of the stewards, distinguished by badges provided by the ever-thoughtful Secretary, Mr. A. Matheson, things were rapidly got into "shipshape," and at 9.30 the anchor was weighed, or would have been had there been one, but, instead, the order was given for the horses to proceed.

Mr. Kyles, of Portobello, was, as on former occasions, master of the ceremonies, and under his active management the stringed band occupying the stern of the vessel was kept hard at work, dancing being kept up with much spirit to the apparent enjoyment of the younger members of the party. Nor were those who were too old or too lazy to dance left without means of enjoyment, as, during the intervals between the dances, the piano was kept busy accompanying the singers, of which there was a good supply for both solos and part songs. Where all did so well and so willingly it would be invidious to particularise; but we cannot avoid saying that, as on previous excursions, a number of the *employés* of Messrs. Ross and Pringle gave ample evidence that the encouragement so long given by the firm to the practice of vocal music is still continued.

In addition to the great beauty of the canal banks and the country through which the canal winds in its serpentine path, there is another charm to the parties forming such an excursion as that we are now describing in the fact that the enjoyment of the day commences with the journey and lasts during the whole time; while in the more modern method of travelling, especially if the distance be considerable, the excursionists spend (it may be) hours cooped up in parties of eight or ten in the comfortless compartments of railway carriages. The dancing and singing were varied by lunch, and an occasional stoppage at some of the more beautiful places, in order that a scamper along the banks or across the fields and a gathering of wild flowers might be enjoyed, and in this way Almond Dell was reached at about 1.30.

On landing, the party broke up into quiet, cosy groups of twos or happy, laughing threes or more, and betook themselves, some—especially the twos—to the shady woods, some to the river side to enjoy a "padle in the burn," some to a quiet lounge on the grass, and some to visit the quaint, picturesque old mill at the bottom of the glen, and have a chat with the old miller or a flirtation with his son. Here the mysteries of the manufacture of oatmeal were fully explained and practically illustrated, much to the delight of many who, although they had all their days been familiar with bannocks and brose, knew little or nothing of how the raw material was produced.

While all this was going on Mr. Annan, or rather his assistant, had been rigging up a dark room and getting his plates prepared, and by and by the party were assembled and grouped for a photograph. Only those who have tried it know the difficulty of successfully photographing a large number of excursionists. Fun and frolic being the order of the day, all are as ready to go off into a hearty laugh as is a gun with a hair trigger, and rarely indeed is the funny man absent, or fails to give the required touch. On this occasion, however, all went well, and two plates were exposed under favourable circumstances—at least so far as stillness on the part of the members were concerned; and, although the light was not so good as could have been wished, two very fair pictures were obtained.

On the intimation that dinner was ready a general move was made to the barge, which had rapidly been converted into a comfortable dining-room, and the tables liberally supplied with good things, in Mr. Pillans' best style, to which such justice was done as is only seen under similar circumstances. After dinner

Mr. J. Lessels, the President, who occupied the chair, said that the stewards had wisely arranged that there were to be no toasts, as he had no doubt that all were anxious for yet a little longer to continue the quiet rambles which had apparently been so much enjoyed, or to take part in the games that had been provided. There was, however, one toast which, he said, ought not to be omitted—"Continued prosperity to the Edinburgh Photographic Society." Of all the good work that it had done there was none more to be appreciated than the institution of the annual holiday, and in view of the very happy day that they were spending, and the capital arrangement that, under the auspices of the Society, had been made for their enjoyment, he was sure they would respond heartily to the toast.

Dr. John Nicol said that although the stewards had omitted toasts from the programme, there was one which even they could not object to—one which they themselves had been drinking more than once during the last few days, and which he knew would be by all present received with enthusiasm—it was the health of the last new member added to the Society. Most of those present knew that the work of the Secretary was very heavy, but they know also how industrious, persevering, and willing a secretary Mr. Matheson made; and as he never even hinted at a difficulty in getting through it, they would be as much surprised as he (Dr. Nicol) was to learn that he had, a few days before, gone and appointed an assistant secretary without consulting a single member of the Society. Others might have done as much, and nobody would have thought any thing about it, but he was quite sure that those who knew Mr. Matheson best were the most surprised when they had heard the good news. Yes, he repeated, it really was good news, as all who had seen her on board that day must be satisfied that he had made a good choice. He was quite sure the union would be a happy one, and asked all present to pledge a full bumper to the health and happiness of Mrs. Matheson, their new assistant secretary.

The toast was received as it deserved to be, and was followed by the usual song expressive of the good qualities of the happy pair.

After a couple of hours spent in games, for which a number of appliances had been provided, and strolling along the dell, according to the tastes of the members, the barge started on the return journey, and the music and dancing were resumed after tea and a liberal supply of its usual accompaniments had been enjoyed. In consequence of a general disinclination to go home while daylight lasted, the halts were more numerous than in the morning, and the raids on the wild flowers so extensive that by and by the barge looked like a moving flower garden, or a fashionable flower show and musical promenade. Shortly before reaching Edinburgh,

Councillor Hay (mounted on the quarter-deck) said that he had been asked to discharge a pleasant duty. He was aware that many wondered wherein lay the source of the great success of the Edinburgh Photographic Society, but he thought it was not far to seek. It arose altogether from the fact that the office-bearers were the right men in the right places—men who were equally at home in discussing the merits and demerits of the last new process or organising and carrying out a social gathering—men not merely able to devise, but not above bearing a hand in the carrying out of anything that would tend to promote harmony and good fellowship amongst all connected with the Society. He had, then (he went on to say), much pleasure in proposing a vote of thanks to the President, Mr. Lessels, for the honour he had conferred on them by being present that day, and for all that he had done to promote the success of the excursion.

The President, in replying, said that when on his return from the continent, in November, he found that he had been made President of the Society he thought the members had made a mistake, and he undertook the duties with no little fear. Now, however, he was glad to say that he went to the work with great comfort. Everybody seemed to work so smoothly with everybody else that it became really a labour of love; and he was quite sure that he spoke for the rest of the office-bearers as well as for himself when he said that it gave much pleasure to see the little they had to do thoroughly appreciated. As for the excursion of that day, it had been a great success, and he had enjoyed it thoroughly. The music had been good, so had the dancing, the scenery, the day, and the dinner. The latter item in all such meetings was an affair of much importance, and he thought the members would not be doing their duty unless they accorded a hearty vote of thanks to the purveyor, Mr. Pillans. Those who walked about the town must have been struck from time to time by seeing his name appearing over the door of shop after shop, and could not fail to come to the conclusion that he at least was a successful man. He (Mr. Lessels) was sure they congratulated Mr. Pillans on his success, knowing as they did how thoroughly he deserved it, and that for the best of all reasons, namely, doing the very best he could for his customers.

By this time twilight had deepened into gloom, and while "Auld Lang Syne" was being sung, the barge was made fast at her destination shortly before ten o'clock, when, amidst much hand-shaking and mutual congratulations, the gathering was adjourned till July, 1878.

ON THINGS IN GENERAL.

A Mr. Smith, in the *St. Louis Practical Photographer*, has immortalised himself by what appears to be a piece of plagiarism pure and distinct. He has seized on Mr. Henderson's alum and iron developer, introducing it with the thinnest veil of alteration. Sulphate of magnesia is substituted for the alum in the formula he gives, which, he says, has enabled him to dispense with the use of alcohol in his developer during the past year, and he yet experienced no difficulty in flowing his plate.

Of course he did not. Mr. Henderson has told us all about that; but as he did not charge two guineas for it nobody has paid much attention to his information, and, probably, will not until a process-exploiter extracts a few golden coins from them under promise of secrecy, and then conveys Mr. Henderson's knowledge to them. Why, though the formula was only promulgated a few weeks ago, its author's name might be already forgotten; it was only the other day I heard that someone who ought to know better "remembered to have seen it somewhere, but could not recall where" (it was in the pages of THE BRITISH JOURNAL OF PHOTOGRAPHY); and he was further under the impression that "its chief difference from the ordinary iron developer consisted in the addition of alum and camphor," for the purpose, as Mr. Wilkinson alleges, of securing in the developer a similar density to that in the nitrate bath, the necessity having been pointed out before. As far as my memory serves me, the gentleman named has as much to do with the formula as a hippopotamus with the integral calculus.

We are having a run upon formulæ just now. I see in the *Moniteur*, heading the first page, an unabbreviated account of a set of formulæ to increase rapidity, "tried with success by many" it is stated. I need scarcely say it is an old collodion recipe and developer published over and over again in these pages—the latter with two parts of copper added for every five parts of iron. The readers of the above journal are requested to try the new process and report upon it—in time, no doubt, to be awarded a medal by the Parent Society, who have given a list of medal subjects, but with such syntactical confusion that I defy any one to comprehend it. Already one attempt has been made to publicly explain the meaning of the announcement, but as the explanation itself wants explaining one is as far off as ever. Perhaps the Editors will try their hand.

One of the most remarkable statements about the sensitiveness of the film I have ever heard was made the other day before the Photographic Section of the American Institute, in relation to pre-exposure, by Mr. D. C. Chapman. One has heard a good deal claimed for this much-discussed method, but never before to my recollection did any one state, as he does, that it increased the sensitiveness threefold! I think I may safely say that this matter is still unsettled, though I do not know of any one yet who makes use of it for all his work; but the so-called continuating action of light upon carbon tissue surely ought now to be beyond the reach of cavil, seeing it has been so long before the photographic public, many of whom have tried it. Apart from that there is many an old carbon worker who would smile to be told it was new. I myself remember, long before ever it was mentioned in the journals, an old carbon printer telling me that his fellow-printers used always to under-print pictures that were not going to be developed "right off."

A very important letter on this said carbon printing appeared in the issue of this Journal for June 15, under the signature of "Vox," which was followed by an equally suggestive one from Mr. Warwick Brookes. The former writer refers to silver pictures he possesses which, though printed twenty years ago, still retain their pristine beauty, and are as bright and clear as when printed, and he then institutes a comparison between them and carbon prints; but of how many pictures in (let us say) his friends' albums, taken less than half that time ago, could he tell the same story? Alas! I am afraid very few. At the same time, however, the faded "carbon" pictures he speaks of have all gone in a much shorter space of time. But he obtains a very just and fitting response from Mr. Brookes. There cannot be a doubt that the so-called chromotype pictures are not and cannot be permanent—in fact, Mr. Sawyer has as good as said so himself. But it is also true that the Autotype Company can make very excellent tissues that will not fade, and particularly in the direction of browns.

It unfortunately happens that few photographers are painters, but those who are can very easily inform their brethren by inspection as to the probable permanency of any pigment picture. We are so used to silver prints that the fact is quite lost sight of that the autotype pictures—whether chromotypes or otherwise—are neither more nor less than pictures in pigments off the artist's palette, and there is no mysterious chemical change hanging over them. It is a fact sufficiently well known that very fugitive pigments have been employed by artists for the sake of their present beauty—"a thing of beauty" in that case not by any means being "a joy for ever;" and so it is with some so-called carbon prints. Let any one take a box of colours, and try to imitate the colours of these pictures; he will find lake almost an essential. Crimson and purple lakes are very fugitive, madder lakes are permanent, but the former are worth as many shillings an ounce as the latter are pounds, and with tissue at threepence a foot it does not need a prophet to say which would be chosen. Aniline colours have been freely used, too, I have the best authority for believing. I, however, do not think that they have been used of late in autotype tissue.

I have written at such length on this subject that I can scarcely do justice to a new star that has risen to tell us some things about gold. For example: in making the chloride, it is evaporated down to dryness and allowed to crystallise. My experience of substances is that when evaporated to dryness they are *not* allowed to crystallise. "Chloride of gold is used in photography as a reagent, quantities being made for toning photographic prints. To some extent it is used in electro-gilding, with excess of bicarbonate of potass." These schoolboy exercises are as much calculated to raise the status of photographic literature, or to impress a stranger with its value, as the communication from Mr. Koch, page 335, would impress him with the honesty of its members. Mr. Koch tells us of a photographer who, for twenty marks, feels it "a duty to the brethren of our art to communicate to them the interesting secret of photography in colours"!!! FREE LANCE.

NOTES FROM THE NORTH.

WHAT is the matter with photographers, photography, or the general public? During the dull days it was not to be wondered at that trade was also dull, and that time hung heavy on the hands of the professional photographer; but now that the merry sunshine is with us nearly all the day things ought to "tak' a thocht an mend." Judging, however, from my peregrinations amongst the profession, business—at least so far as the north is concerned—is still far under the average mark.

I'm afraid the attention of photographers has been too long and too exclusively fixed upon the once-popualr and generally easily-managed *carte de visite*, and now that the tide which carried the little pictures so high has more than began to ebb, photographers are not prepared with anything sufficiently attractive to take their place. It seems to me quite clear that the public are really getting tired of the *carte*. Albums are full, and have been plethoric so long that the public do not care to purchase others. As card after card is received they are added to the general stock, every one of which soon becomes dog-eared and soiled, and so, most certainly, not things of beauty. What are our army of inventors about? and why will they not leave the improvement of emulsions alone for a time and devote some attention to the introduction of something that will take the public taste and send customers to the more than half-deserted studios.*

It would be amusing, if it were not painful, to see with what almost "one consent" the great bulk of the profession are at present trying to push enlargements painted in oils. No doubt some of the pictures so produced are works of art, and fine art too; but they cost more than the majority of those who desire to be photographed are able to pay, and must ever form but a small fraction of the support of the professional photographer; but what shall I say of the same article, including a "guaranteed likeness," offered for one or even two guineas? Probably the less that is said about them the better, except that such wretched daubs, as they generally are, will neither please the originals nor bring "grist to the mill" of the photographer. Whatever the coming novelty may be it *must* be cheap, and should be likely to be required in quantities.

I have written before, and would fain write again, a word in favour of enamels. They are the most beautiful, as they are certainly the most durable, of all photographic productions. There is no difficulty encountered in their production that may not be overcome as easily as the difficulties in the making of a good negative; and they may, with suitable arrangements, be made almost as rapidly as paper prints. As for their popularity, if utilised in sleeve links, studs, brooches, presentation cups, saucers, &c., &c., &c., I have little doubt that the demand would soon be very great, and that with a great deal less pushing than has been, and is being, given to much less likely styles of portraiture.

I am glad to see that the concession to photographers recently made in France to photograph the national collections with dry plates is likely to be imitated nearer home. Our antiquarian and science and art museums here are rich in articles photographs of which would be interesting to the public and profitable to the photographer; and, although the custodians have not been unwilling to allow them to be photographed, the permission has been very much restricted in consequence of the mess sometimes made and the difficulty of getting a suitable place for preparing and developing the plates. Now, however, I understand that arrangements are about to be made by which dry plates may be freely used, and I hope that advantage will be largely taken of such permission.

I presume it is generally known that if gelatine be raised to too high a temperature it readily loses the property of setting; but it may not be so well understood that frequent warming, although only sufficient to liquefy it, produces the same result. I was present a few days ago while some experiments were being made, and the operations were about to be suspended on account, as it was thought, of the temperature and moist air preventing the setting of the gelatine film. I learned that the emulsion worked admirably at first, but that it had been found to set with more and more difficulty day by day. Suspecting the cause, I suggested the trial of an unopened bottle made at the same time as that which had been in use, and it was found to be in good order.

It would be well for those who use a gelatine emulsion that will keep for some weeks to put the stock into a wide-mouthed bottle, and with a bone spatula or slip of glass to take out only as much as is to be used at the time, and liquefy it in the bottle from which it is to be poured.

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* But *why* should the "army of inventors"—for the most part amateurs—forsake their scientific investigations for the purpose of sending customers to deserted studios? Those who live by the patronage of the public should themselves cater for the requirements of that public.—EDS.

Photographers had better look to their laurels, as a competitor has entered the field of which they have hitherto little dreamt. On the sands of our popular seaside resort, Portobello, there is at this moment a tent of the genus photographic, but not devoted to the practice of photography. The cases which adorn the front are filled with specimens, and exceedingly good specimens, of the once-popular silhouette—a profile cut out of black paper and pasted on a sheet of white. The *artiste* in this case is, however, as purely a mechanic as ever handled a camera, and gets his outline by a kind of pentograph which he causes to pass over the parts to be portrayed. He estimates the value of the result of his labour at the modest sum of threepence each, with a penny additional for bronzing the hair, &c. Cheapness is apparently expected to be the road to success here. We have been for months offered our *carte* portrait for one shilling, but in Portobello we can have three, retouching included, for the same amount. Again, I say photographers had better look to their laurels. JOHN NICOL, Ph.D.

Meetings of Societies.

AMATEUR PHOTOGRAPHIC ASSOCIATION.

A MEETING of the Council of this Association was held on Wednesday, the 4th instant,—Sir Antonio Brady in the chair.

The minutes of the last meeting having been read and confirmed, the Secretary read letters from Lord de Ros and Dr. Arthur Farre expressing their regret at being unable to be present.

The following members and subscribers were elected:—Sir George Prescott, H. Davies, Esq., Ernest Soutter, Esq., J. W. Young, Esq., R. Leventhorpe, Esq., E. Swinburne, Esq., A. Watkins, Esq., and Mrs. Herbert Evans.

The Secretary laid before the Council the pictures for the current year.

Mr. J. GLAISHER, before reading his annual report, remarked that he and his brother referee, after carefully examining every picture, were much gratified to find that the negatives sent this season by the members were certainly better than those of any previous year. The works of Dr. Cooke—to whom was awarded the first prize last year—were even better than ever, and some magnificent pictures by Mr. R. O. Milne were deserving of especial attention. In fact, he (Mr. Glaisher) thought that nearly every contributor gave evidence of improvement, and he considered that this sign of not merely sustained but increased vitality in the Association must be most gratifying to the Council, especially at this period of unusual depression. The following is an abstract of Mr. Glaisher's report:—

Class I. contains 90 pictures, contributed as follows:—Dr. Cooke, 17 large pictures; R. O. Milne, Esq., 13 large pictures; T. Beasley, Esq., 18; W. S. Hobson, Esq., 7; Major Chadwick, 7 large pictures; J. McAndrew, Esq., 5 Spanish views; R. Murray, Esq., 5 dry-plate pictures; J. C. Stenning, Esq., 3; J. Adams, Esq., 3; W. Vanner, Esq., 3; T. Brownrigg, Esq., 2; F. Schwabe, Esq., 2; F. Adderley, Esq., 2; Lieut. S. G. Fairtlough, 2; Capt. McNeill, 1.

Class II. comprises 90 pictures, contributed as follows:—R. Murray, Esq., 6; J. McAndrew, Esq., 6; Dr. Cooke, 6; Capt. McNeill, 6; F. Beasley, Esq., 5; F. Adderley, Esq., 5; P. Gunyon, Esq., 5; W. Vanner, Esq., 5; W. H. Kirkby, Esq., 5; W. S. Hobson, Esq., 4; J. C. Stenning, Esq., 4; R. O. Milne, Esq., 4; Lieut. S. G. Fairtlough, 4; Capt. J. B. Fox, 3; Major Chadwick, 3; A. L. Steavenson, Esq., 3; G. W. Keeling, Esq., 2; T. Brownrigg, Esq., 2; S. G. B. Wollaston, Esq., 2; J. Adams, Esq., 2; F. Schwabe, Esq., 1; K. D. Roberts, Esq., 1; W. W. Unett, Esq., 1; Miss L. Coxe, 1; W. Muller, Esq., 1; Mrs. Deeble, 1; Rev. H. Palmer, 1.

Class III. comprises 93 pictures, contributed as follows:—F. Adderley, Esq., 10; S. G. B. Wollaston, Esq., 7; Mrs. Deeble, 9; Capt. McNeill, 7; J. McAndrew, Esq., 7; K. D. Roberts, Esq., 6; P. Gunyon, Esq., 6; — D'Esterre, Esq., 6; A. R. Hunt, Esq., 5; W. Vanner, Esq., 4; Rev. H. Palmer, 4; Miss L. Coxe, 3; A. L. Steavenson, Esq., 2; Lieut. S. G. Fairtlough, 2; J. Adams, Esq., 2; Capt. J. B. Fox, 2; E. Milson, Esq., 2; G. W. Keeling, Esq., 1; F. Beasley, Esq., 1; F. Schwabe, Esq., 1; G. M. Green, Esq., 1; J. C. Stenning, Esq., 1; R. O. Milne, Esq., 1; W. H. Kirkby, Esq., 1; W. W. Unett, Esq., 1.

The remainder of the pictures are classed in Classes IV., V., and VI.

The following prizes were awarded:—

Dr. Cooke, *first prize* for Nos. 53, 57, and 62—a large silver goblet. R. O. Milne, Esq., *second prize* for Nos. 53 and 62—a silver goblet. Major Chadwick, for Nos. 4 and 8—an oil painting in frame. F. Beasley, Esq., for Nos. 273 and 274—a large album elegantly bound in morocco. W. S. Hobson, Esq., for Nos. 145 and 146—a ditto, ditto. J. C. Stenning, Esq., for Nos. 58 and 59—an oil painting in frame. F. Adderley, Esq., for Nos. 13 and 14—a ditto, ditto. R. Murray, Esq., or Nos. 118 and 121—a ditto, ditto. W. Vanner, Esq., for Nos. 5 and 12—an album elegantly bound in morocco. T. Brownrigg, Esq., for Nos. 33 and 34—a ditto, ditto. Lieut. S. G. Fairtlough, for Nos. 5 and 8—an oil painting in frame. Dr. Cooke, for Nos. 56, 58, and 66—a ditto, ditto. R. O. Milne, Esq., for Nos. 60 and 61—an album elegantly bound in morocco.

Certificates of honourable mention were awarded to Capt. McNeill, J. Adams, Esq., F. Schwabe, Esq., and J. McAndrew, Esq.

A vote of thanks was proposed by the Chairman and seconded by Mr. Gooch to Mr. J. Glaisher for his able report; and a vote of thanks was proposed by Mr. Gooch and seconded by Mr. Howard to the referees for the time and trouble they had bestowed in the examination, arrangement, and classification of the pictures. Both votes were carried unanimously. A. J. MELHUISH, *Hon. Sec.*

Correspondence.

CARBON PRINTING.

To the EDITORS.

GENTLEMEN,—It is really handsome on the part of the Autotype Company so distinctly to publish their intentions, as now photographers know exactly what they have to expect.

Until the expiration, then, of Swan's patent on the 29th February, 1878, the company "claims entire control" (to use their own words) of the carbon process of photographic printing. Why, Mr. Swan never claimed this himself, for he modestly states his invention to relate to the method of printing known as carbon printing. But, now, if poor Mr. Blair were alive, or Fargier, or Poitevin, they must "hide their diminished heads," or sue for permission to do what they did twenty years ago and over from those who "*claim entire control* of the carbon process of photographic printing." Moreover, after the expiry of this patent, and during the duration of Mr. Johnson's, the company "claim the control" of the double transfer process, as though "double transfer" were not distinctly enough claimed by Mr. Swan in his own patent, which describes explicitly the remounting or transference of developed prints from a temporary to a permanent support.

Perhaps there may be some special method of proceeding which Mr. Johnson's patent may cover, and to this extent, and no further, may the company "claim control;" but outside of any method specially defined in that patent, *any* method of working will be perfectly untramelled. This, of course, is upon the supposition that Mr. Johnson's patent is a good one, about which some difference of opinion seemed at one time to exist, if we refer to your columns of September, 1870, to January, 1871, where it will be seen that Mr. Blair, who was himself a lawyer, raised some very salient questions upon this point.

It is also very obliging on the part of the company to "empower" Messrs. Marion and Co. to manufacture transfer papers; but it would be interesting to trace in what corner of the patent office the right to any such privilege has been hidden away. I can find there no existing patent of any kind which claims any special method of making paper for transferring. The only indication of anything of the kind is in the specification of Ernest Edwards, July 13, 1868, wherein he did speak of preparing paper or other surfaces by treating them with gelatine rendered insoluble with alum or other matters; but, as this patent lapsed some six years ago, it is as open to Messrs. Marion and Co. as to anybody else, without any necessity for being "empowered" by any one.—I am, yours, &c., CARBONIENSIS.

July 16, 1877.

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OYSTER-SHELL MARKINGS.

To the EDITORS.

GENTLEMEN,—Most contributors to your columns hold upon this subject different theories, and suggest different modes of cure, such as they have found to answer in their particular cases. It therefore seems tolerably clear that the real reason for their formation has yet to be discovered, and, as a natural consequence, the method of cure.

Much stress has been laid upon thorough draining of the plate, and few practical operators will deny that thorough draining will minimise many of the usual faults, such as streaks, stains, and various kinds of markings; but as to curing "oyster shells" I am convinced by much experience that it is very little use. Whilst there remains on the film sufficient silver to make the image there is sufficient silver to form "oyster shells." No matter how long and how well a plate may be drained, if the *subject* to be photographed is of so *feeble actinic power* as to necessitate a long exposure—a dark interior, for instance—or even with a short exposure, if the subject be of a trying character, such, for instance, as would make a negative containing some amount of clear glass and shadows with the faintest of detail, the difficulty will be encountered.

These classes of subject are peculiarly liable to this fault, and no plan that I ever tried or heard of will cure them. Certain precautions may tend to lessen them—especially that of well draining the plate—but will utterly fail to prevent their occurrence. In my opinion their formation is entirely due to atmospheric influences, irrespective of bath or chemicals. I do not mean to infer that chemical conditions will not make any difference, as some will increase and some diminish the effect; but no chemical condition that we can obtain will prevent "oyster shells" providing atmospheric conditions are favourable to their production. The identical preparations that will during one portion of the day be almost unworkable from this cause will in the space of a few hours work as well as can be wished, and *vice versâ*.

I was once particularly troubled in this way, and no scheme that I could devise seemed to effect any benefit. At this particular period the aurora borealis used to make vivid displays in the evenings. May not magnetic disturbances be the cause? I did not attribute the defect to this cause at the time, but since observing many photographers complain about the same time of the same defect it occurs to me that disturbances of this nature play a considerable part in the process, as it is unlikely the chemicals of so many different workers would go wrong at the same time in the same way. Photographers, as a rule, have no opportunity of making observations of atmospheric conditions when they are busy with their work, even were they acquainted with the *modus operandi*. There is a wide field for research in this direction, and mayhap such investigations would explain many of the difficulties which at the present time baffle the photographer.

These "oyster shells" are generally more troublesome in the spring and autumn than in the hot summer weather, when they might be expected, which seems to somewhat confirm my opinion that they are principally due to atmospheric disturbance. The action seems something of this kind:—A solution of a salt capable of precipitating silver in a metallic state is applied to a film upon which the light has very feebly acted, the portions acted upon are, in fact, insufficiently attractive to the metal in the act of deposition to overcome an atmospheric influence that has a design of its own to form, consequently these particles of precipitated metal ignore the faintly-impressed image, and become entirely under the control of another agency and form oyster-shell markings. If it were not so the precipitated metal would, as it frequently does (this disturbing cause being absent), deposit itself in an even manner and form what is generally termed fog by over-development.

It must be observed "oyster shells" very rarely form on a negative of a subject of very actinic character. If they do they will commence or be confined to some part of the film that is very little or not at all acted on by the light. It may also be noticed that wherever they form the surrounding portion is always more deficient in force, and if the marks are carefully removed no image will be found beneath, or, at most, a very faint trace. On these data I base my opinion that in all probability magnetism is the cause of this trouble. A series of experiments to determine this would form a very interesting investigation.—I am, yours, &c., EDWARD DUNMORE.

July 17, 1877.

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EXCHANGE COLUMN.

Tench's No. 1 baby lens in exchange for a good dark tent on wheels.—Address, J. S., Other's Buildings, Gainsborough.

Woodbury's sciopticon, with case and extra fittings, cost £6 15s., in exchange for rectilinear doublet or *carte* lens; also silver-mounted flute, by Rudall and Rose, cost £10, for photographic apparatus.—Address, F. MAYNARD, 45, Treverton-street, North Kensington.

I will exchange, for a month or longer, Cooley's *Cyclopædia of Practical Receipts, Processes, and Collateral Information in the Arts, Manufactures, Professions, and Trades*, price twenty-eight shillings, for Bigelow's *Album of Lighting and Posing*.—Address, N. M. WOOD, High-street, Bangor, N. Wales.

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ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

IGNORAMUS.—By making use of the term $\frac{f}{20}$ we mean that the relation of the aperture in the stop was to the focus of the lens as one to twenty.

C. S. S.—Dilute the albumen with three parts of water, and then add ammonia in the proportion of fifteen drops for the white of each egg used.

MAWSON AND SWAN.—Received. The "miraculous pens" appear to be very useful, and we have no doubt they will be appreciated by many, especially by travellers.

G. V. DAVID.—We quite agree with this correspondent in his high estimate of photo-enamels, and regret that they are not more appreciated. Perhaps public taste may become revolutionised in this direction.

ATTICUS (Preston).—The plan No. 1 will be the best if you can put in a side light reaching nearly to the floor. The sun can easily be stopped out by a suitable arrangement of blinds, by which its access to the lens would be entirely prevented.

ROBT. HAUGHTON.—For the everyday, practical purposes of the photographer the argento-hydrometer is very useful; but it is not to be relied upon if an accurate analysis of a solution of silver be required. In this case the strength must be determined by precipitation with chloride of sodium.

F. J. DAUBAN.—The art of making stereotype casts from plaster moulds cannot be properly taught in this column. You should apply to a practical stereotyper for permission to be present while he is at work. It will be still better if you pay him a fee for a brief course of practical instructions in stereotyping.

C. B.—It is quite impossible to focus sharply when you have such a coarsely-ground glass as your focussing screen. We do not think the focussing glass of our own camera too fine by many degrees; but as compared with the sample you send it is perfection itself. Lose no time in removing your present ground glass and supplying its place with another of much finer quality.

G. S. H.—The cause of the yellow markings in the prints may be traced to the fact of the paper having been handled by some one whose fingers have been wet, or moist, with a solution of hyposulphite of soda. By the exercise of care and ordinary cleanliness mishaps of this kind may be avoided in future.

M. A., Jun.—The best method of holding a small lump of ore in the microscope is to adopt one of the screw stage-holders now so easily to be met with. It consists of three claws, which, by the action of a screw, are made to approach to or recede from each other, so as to clasp any object of moderate dimensions.

S. W. W.—An admirable developer may be made as follows:—

Protosulphate of iron	15 grains.
Acetate of soda	15 ,,
Glacial acetic acid	30 minims.
Alcohol	30 ,,
Water	1 ounce.

GEORGE B. HUNT.—It is quite easy to produce carbon vignettes either in the solar camera or in the printing-frame. We strongly advise you not to give yourself so much trouble concerning the preliminaries. Cease brooding over imaginary difficulties which have no real existence, and make a bold leap at once into the *practical* work of carbon printing. Discontinue reading more about it until you have at least made the attempt to produce some prints.

R. D.—No. 1 on your list, if purchased second-hand, should be rather lower in price than No. 3, purchased under the same conditions. You ought to have purchased the glacial acetic acid by bulk rather than by weight. To prevent the black varnish from drying glossy mix with it a quantity of lampblack. Try a mixture of black with negative varnish, the former being adjusted so nicely to the latter as to ensure a black coating without any gloss.

AUSTRALIAN.—Several years ago we endeavoured to discover the cause of an abnormal degree of insensitiveness in certain plates protected by a preservative in which ale formed the principal ingredient. We eventually found it to arise from the presence of a large proportion of common salt which, for some reason to us unknown, had been dissolved in the ale by the publican from whom it was purchased. Test for chloride of soda the ale which you are trying.

C. BROWN.—The scenograph is very ingenious, and answers the intended purpose quite well; but having recently seen and carefully examined a new and patented portable camera invented by Mr. W. B. Woodbury, the agent for the scenograph, we cannot recommend the latter as at all worthy of being compared with the more recent invention, which has some points of similarity with the other. It is probable that by addressing a note to Mr. Woodbury you may obtain full particulars. In reply to your other inquiry see an editorial article in the present number.

PHOTOLITHO.—The following proportions will answer, at present, for preparing photolithographic transfers. We say "at present," because the best proportions for summer use are not found to answer best during winter:—

Gelatine	5 ounces.
Bichromate of potash	1 ounce.
Water	2½ pints.

In cold weather the proportion of bichromate may be increased and those of the gelatine decreased.

COOLING DRINKS FOR PHOTOGRAPHERS IN THE STUDIO.—Mr. A. J. Jarman, of Ramsgate, sends us the following on this subject:—"A very cheap and refreshing drink may be made to suit most persons' palates, I think, in the following way, and I am sure must be of great use to others engaged in hot studio work as well as myself:—Take two pounds of loaf sugar and half-an-ounce of tartaric acid; dissolve them in one quart of boiling water; add thirty drops of essence of lemon and twenty drops of essence of almonds; stir well, and cover with a cloth until cold. Take two tablespoonsful of this to a tumbler nearly filled with cold water. This will be found a most beautiful and refreshing drink. It costs but elevenpence-halfpenny for the ingredients, and makes ten pints of a healthy and palatable beverage. Let those confined in hot dark rooms try this, and, once tried, will be always used, I feel certain. It is cheaper than ginger-beer or lemonade, and very much superior in taste."

CARBON PRINTING.—S. S., Frater, John Hart, and several others have written to us respecting our article in last week's number, in which we describe our experiments with the Monckhoven solar enlarging camera. They all suggest the desirability of so modifying the apparatus as to render them quite independent of the sun. "Would not," writes one, "the compact and powerful little oxyhydrogen apparatus shown at a meeting of the South London Photographic Society a few months since answer for this kind of enlarging?" To this we reply that, while the luminous power of the lime light is undoubtedly great, its actinic power is by no means energetic. The electric and magnesium lights are much more actinic than the lime light, and these must be employed in all efforts made to bring artificial light into comparison with that of the sun for photographic purposes. In reply to some other observations we have to say that we, with them, regret that the Sun shows himself so seldom in this quarter of the globe; but we have no control over the clouds which interpose themselves between the earth and that luminary.

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 899. Vol. XXIV.—JULY 27, 1877.

SINGLE TRANSFER.

In Three Chapters.—Chapter I.

The publication of our article on the experiments recently made with the Monckhoven enlarging camera has led to our receiving several letters on the subject of carbon printing, more particularly upon that phase of the process known as single transfer. In deference to the wishes of some readers whose knowledge of carbon printing is limited, and of others who desire to adopt this method of printing, if only by way of experiment, we now devote a few articles to the subject.

As may be inferred from the title, carbon printing by single transfer is the simplest of all the processes by which pigmented prints are produced. It may be summed up, "in a nutshell," as follows:—Upon removing the carbon tissue from the printing-frame in which it has been exposed to light under the negative it is immersed for a few seconds in cold water and is then applied, face downwards, upon its "permanent support," whether that support be canvas, paper, cardboard, opal glass, wood, metal, or plain glass. By means of hot water the image is developed upon this support, to which it adheres permanently.

We have recently seen some specimens executed by the single transfer process which compare most favourably with the finest "chromotypes" we have yet seen. But when we consider the various steps taken in their production we do not see why they should not only be as fine as, but even finer than, the best chromotypes, because, after all, a chromotype is merely a carbon picture that has received a glazing of collodion; and by a subsequent process this superficial facing can easily be imparted to carbon pictures in the same way as it has so long been to prints upon albumenised paper.

The great difference between carbon printing by single and by double transfer consists in the pictures obtained by the former process being reversed; and in any exhaustive exposition on this method of printing full attention will have to be bestowed upon the various methods by which the non-reversing of the picture may be successfully overcome. In the following observations we shall allude to these with as much fulness as space permits.

We must, however, premise that in all processes of *enlargement*—whether by lantern, ordinary enlarging camera, or solar camera—the original position of the negative as regards reversal or non-reversal is of no consequence whatever, as accuracy is secured by turning either the one side of the negative or the other to the lens by which the enlargement is to be produced. But, as the present article has to do with carbon as practised by the aid of the printing-frame and by that of the copying or enlarging camera, it is obvious that the production of a reversed negative is of primary importance, as a *cliché* of this kind gives a non-reversed print, and *vice versâ*.

There are several methods by which this may be effected—some of them, in the most improved form of their details, not having been published previously. The method of producing a reversed negative by reversing the position of the plate in the dark slide is well known and has been much adopted; but there has always been dissatisfaction expressed with it on account of the differences found in the thickness of the glasses upon which the negatives are to be taken. It is easy enough, when a plate is placed backside foremost in the dark slide, to estimate the thickness of the plate and make such an allowance for it by racking-in the lens as to bring the film into coincidence with the ground surface of the focussing-screen; and if such adjustment be accurately made a sharp picture will be obtained even through the plate of glass. But as the amount of racking-in of the lens will vary with each plate, unless absolute uniformity in the thickness be secured the difficulties inherent in obtaining uniform sharpness are too great to render this method as popular as it should be.

A certain method we have adopted obviates all trouble, and ensures perfect coincidence of the sensitive films, quite irrespective of variations in the thicknesses of the glass plates. This method, as applied to a half-plate camera slide, we shall now describe.

Upon the faces of the frame on which the plate is placed when dropped into the dark slide are fixed four springs, one near each corner, these springs having a tendency to throw the plate back from the rebate upon which it would otherwise rest. The spring always present inside of the back door of the dark slide, and by which the plate is pressed into close contact with the face of the rebate, is removed, and instead of it four short silver pins are inserted in the back door in such a position as that, when a plate is inserted in its place and the back door closed, these projecting pins will press against the plate close to its margin and force it rigidly against the springs on the opposite margin. These springs yield, but the silver studs have their positions accurately fixed with respect to their distance from the lens. It follows, therefore, that when a sensitive plate is placed in the dark slide with its collodionised side out, the mere act of closing the door will ensure this film side a certain position which does not depend in any way upon, and is not in the least degree influenced by, the thickness of the glass itself. The springs may be flat, like a piece of watch spring, or a spiral form may be adopted. The former is the more convenient. This method, in brief, consists in effecting an entire reversal of the springs in the dark slide; for, instead of their being made to press the plate forward, as in ordinary use, their function consists in pressing the plate backwards against the silver studs or pins.

The advantage of this method consists, first, in only one adjustment of the lens being necessary. This adjustment may be made in the course of a few minutes, and serves for all future time. Secondly, the efficiency of the camera and dark slide for ordinary non-reversed negative work is not interfered with. In order to use it for this purpose it is only necessary to insert the plate face *down* instead of face *up*, and place behind it a pad of such thickness as that when the door is closed the elastic force of the springs, which need only be very slight, will be overcome and the face of the plate allowed to rest against the face of the rebate itself, instead of against the springs, which are now forced back into the recess provided for them. In the latter case the lens is allowed to remain unaltered after the focus has been adjusted upon the screen; in the former case it is racked-in for the portion that has been previously determined upon. In either case the resulting negatives will possess an equal degree of sharpness; but one will be reversed, while the other will be non-reversed.

Although we have here spoken of a "pad" being placed behind the plate for the purpose of pressing it forward and overcoming the force of the four springs, it must be obvious that this result will be equally well secured by means of a strong spring affixed to the inside of the door of the slide. This spring must, however, be controlled by a button or knob on the outside, by which the spring may either be drawn back so far as not to damage the film when a negative for carbon printing is about to be taken or liberated so as to exert its full force upon the back of the plate when a negative of the ordinary description is wanted. Those who are in possession of the *older* forms of changing-box and dark slide will be thoroughly familiar with mechanical contrivances of the kind now advocated for controlling the action of the spring.

We recommend this modification in the construction of the dark slide as one which will assuredly give an unmeasured degree of satisfaction to those who adopt it; because, without any trouble whatever and without making any change in the apparatus, a reversed or non-reversed picture may be obtained at will or one after the other without the necessity being experienced for moving the camera or even re-focussing.

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PRESERVATION OF PHOTOGRAPHS IN FRAMES.

It might be for a moment supposed that the title of our article was a misnomer, as many persons are under the impression that the framing of a picture is the *ne plus ultra* of precaution against the ravages of every destructive agent, internal or external. We trust, however, to show that it is quite possible to put the matter in an entirely different light, for we have within the last month or two been making a raid amongst framed pictures, with the intention of discovering any shortcomings they might possess, and have been no little surprised at what we have been able to discern.

The subject is glanced at in Mr. G. Watmough Webster's remarks upon opal glass, which appear in another portion of our columns. He instances the case of opal glass having become discoloured after the time it was first framed. But, we may go a little further than that, and, still taking the opal glass as an example—as signal an illustration as it is possible to find—we would call attention to the change of colour having taken the shape of the aperture or "sight" of the mount behind which it is placed in the frame; that is to say, if the opal be, for instance, a vignette upon a white ground, it will be observed upon removing the plate from the frame that the outer portion of the opal almost entirely retains its original whiteness, upon which will be distinctly defined, in a dull, brown tone of greater or less depth, an exact representation in the shape of the mount—oval, ogival, or otherwise. We need scarcely observe that this appearance is not perceptible upon opal glass alone; nor, indeed, is it confined to photographs. Too many valuable pictures bear witness of the same effect.

On the rare occasions upon which the appearance has been noted it has been passed by as being a curious effect of light, and nothing more has been said or done in the matter. Now, although we are ready to admit that in many cases light may be the cause of the evil, we yet are thoroughly inclined to believe that in the majority light is not the agent in producing this effect. Mr. Webster shows how in opal glass it is not, and there are many reasons why the hypothesis is untenable with other media.

It is generally noticed that photographs in a book or portfolio are more free from fading than others more openly exposed to atmospheric influences. This greater freedom is owing to the fact that as the pictures usually touch one another there is not a free current of air over their surfaces, so they are subjected to a smaller amount of the deleterious agent, whatever it be, in the air. The atmosphere is never still; there are perpetually currents which pass in all directions in it which cause a given area of a substance to be subjected to the action of a larger amount of noxious vapour or gas than an equal area without current, and it is evident that the nearer two given surfaces are together the less freely does air circulate between them. Indeed, it is most probable that, in ordinary cases, when a number of pictures are in contact the only cause of any shifting of the thin strata of air between them is that power of diffusion by which gases differing in physical properties have a constant tendency to mix together till they are equalised, which they will do even when separated by an obstacle so dense as a brick wall; and naturally this diffusion is less carried out the greater the distance the gases have to travel.

Returning now to our typical picture in its frame: that part which is not exposed to light and is not visible will be packed close, so that it will be in contact with the back of the mount, while the visible portion will be exposed to the action of a layer of air from an eighth of an inch upwards in thickness—in fact, many hundred times in bulk more than the slight film, as it might be termed, imprisoned between the contact surfaces. If this were all the air to be taken into account its deleterious properties would soon be exhausted, and after the absorption of the deleterious gases, and the deposition of suspended particles, no harm would be done; but this would only be possible in an airtight chamber, to which a picture frame could never be likened. Day after day the wonderful laws of diffusion operate to change the air of the interior of the frame, and day by day the effect is heightened. It is well known that the atmosphere is always full of floating, invisible particles, which become gradually deposited upon all objects in its vicinity. This is a point, apart from the floating dust which settles everywhere and covers our furniture with a gritty mess, requiring constant removal. What we speak of is a finer deposit that clings to everything, in all positions, and accumulates very slowly, but whose insidious advances, nevertheless, have to be guarded against. It is, in truth, an accumulation of minute living organisms, animal or vegetable, which constantly increase and multiply like weeds. We all know how the outside of the glass in a frame requires periodical cleaning, bright furniture polishing, and all kinds of polished articles well rubbing from time to time to remove this deposit. This same substance, we believe, may be added to the list of agents that attack pictures in frames.

If, however, the pictures are framed, it is possible, by keeping out the atmosphere as much as possible, to reduce this danger to the smallest dimensions by carefully covering over all orifices or apertures through which such fine particles could pass. This is, or should be, done when the picture is being framed—by, first, pasting the glass into the frame; and, secondly, well pasting the back in the same manner, so as not to leave the minutest of apertures, care being taken not to omit to paste over any junctions in the backboard. The only air then gaining entrance into the interior of the frame would be that carried by diffusion, and the deposition of organic matter would be very slow.

We have, as we said at the commencement of our article, noticed so many instances of defective framing sent out, even by some of the largest and best framing establishments in the country, that we particularly point out the need for guarding against them. The most common evil is the non-pasting of the glass into the frame, or, if it be pasted, the slight giving way of the paper employed at one point or other. If the space left uncovered be large the evil quickly shows itself, large quantities of very palpable and visible dust settling inside in a conspicuous manner within a very short space of time. Merely to name this is to point out the cure.

Then, again, the back is often not pasted in, or it is perhaps composed of a number of pieces not fastened together, nor yet the crevices between them pasted over. This is a very fruitful source of discoloration; in old-standing cases we have seen the dust actually show through a picture from back to front.

There is one thing which no amount of pasting of the ordinary kind will get rid of: we allude to damp. A picture, even in a room without a fire, may actually run down with moisture inside under some atmospheric conditions, this often resulting in mildew.

To sum up: we say, in framing, every care must be taken to avoid circulation of air, and even then a photograph is under less favourable circumstances than one simply kept in a packet or pasted in a book which is usually kept closed.

ON THE CHOICE OF SUBJECTS.

Little argument is necessary to prove that in lanescape work success is dependent at least as much upon the proper choice and arrangement of the subject as upon mere manipulatory skill; for, though a negative may be technically faultless, it is quite possible that want of due care in the selection of the subject, or the exercise of sufficient taste in its treatment, may render it wholly valueless as a picture. This is, perhaps, a truism with which the majority of amateurs will consider themselves sufficiently acquainted to render it a work of supererogation on our part to bring more closely under their notice; but we would ask them to look round and examine their own portfolios and those of their friends, and judge for themselves what percentage of the pictures they find, after careful study, to be really deserving of the name. We fear that, in too many cases, the result will be to convince them that, in spite of all the fancied skill and artistic perception, *pictures* are the exception rather than the rule.

It will be instructive to turn over, as we have recently had an opportunity of doing, a collection of photographs with an artist. By this term we mean a painter—a man who, in order to make himself a position in his profession, has had to study not only the effects of colour and of light and shade, but also the strict rules of art as applied to outline. We say nothing of perspective, for in that respect the photographer is bound down by the capabilities of his lenses, and relieved perhaps of all trouble. It will be worth noticing how very few out of the whole appear to excite any interest, or to attract more than a passing glance; yet this man is examining the truest transcripts of Nature in her most picturesque phases—searching for her beauties, but fails to find them, and why? To him technical excellence of manipulation is of no more value in a photograph than the mere washing-in of an even tint of colour in a sketch—a power which he acquired before attempting to paint from nature. "This may be a good photograph," we can imagine him saying, "*as a photograph*, but as a *picture* it wants foregound;" or, "the foreground is very nice, but the outline of your distant hill is too straight;" or, again, "the composition is broken by this tree and the middle distance lacks contrast," and a host of other objections unintelligible to the mechanical photographer. It is "hard lines" upon the photographer to thus condemn his work wholesale, and brand it with the title "mechanical." The artist on his part should be generous, and remember that the photographer is not endowed with the same power of "idealising" or improving his subject that he himself possesses, but has to take it much as nature offers it to him. On the other hand, we are ready to admit that there is room for much to be done by the photographer to raise the artistic status of his work—not only by studying more carefully the purely æsthetic side of the question, but also by devoting greater attention to matters more closely connected with his own branch.

Very few amateur photographers, we imagine, have the inclination or can spare the time to make as complete a study of art as their brethren of the brush, nor, perhaps, does the character of their work necessitate it; attention to a few simple rules, combined with a natural perception of the artistic, will be found to work a great deal. Without the latter quality it is almost hopeless to expect any great results. Even with the possession of the needful artistic culture it still remains, after mastering the technical or "mechanical" part of the work, to turn to the best advantage the assistance profferred by Nature herself; and it is here that photographers, as a rule, exhibit the greatest perversity. It would be useless, even were it possible, on our part to reiterate what has been so frequently said of the importance of securing the best condition of light to suit the subject. That is a matter which the veriest tyro understands thoroughly, if the continual dinning of the advice into his ears counts for anything; but still he pursues the even tenor of his way, setting nature at defiance and trusting to his own cleverness to bring matters right "in development." If there really exist any who cling to the idea that such a course is possible in spite of all that has been written to the opposite, it cannot be too emphatically stated that their faith is entirely groundless. Development is capable of performing much, but it cannot perform impossibilities. It may succeed in raising the value of the lights or in deepening the shadows—in promoting or lowering contrast where, owing to errors of exposure or other causes, there is room for such improvement; but to create either lights or shadows is entirely beyond its power.

A very large majority of amateurs, to whom these remarks are more immediately addressed, are so situated as to be able to devote but little time to their favourite pursuit; and when they are enabled to snatch a few days from their usual labours are, besides being at the mercy of the "clerk of the weather," obliged to work under adverse conditions or to refrain from working altogether. Their chances of producing really high-class work are, therefore, few and far between, depending, as they do, so completely upon the chapter of accidents; and a more than ordinarily good result is, to them, something to be cherished from its rarity. We have now to offer a few suggestions which, if followed, will tend to raise the percentage of good results, even under very unpromising conditions; and the precept we select as our text is—"Choose your subject to suit attendant circumstances." Never mind what splendid subjects you meet with, if the conditions do not suit pass them by; better a good "all-round" result than the most perfect composition or the grandest view spoilt in the treatment.

First, let us suppose the weather to be all that could be desired. Here all the photographer has to do is to exercise his judgment and stick to the text we have given. No matter how tempting the subject, if the conditions of light are unfavourable—that is, if the sun be not in the proper position—do not attempt it. The lights and shadows being strongly marked, the result will be more unsatisfactory than if the day were cloudy and dull, and the negative will remain as an eyesore to remind you of one more plate wasted. Very pleasing effects are sometimes obtained under apparently unfavourable conditions of light; but these should only be attempted by those possessing a thorough mastery over the manipulatory portions of the process, and then only with a perfectly distinct idea of the effect it is desired or expected to secure. Haphazard ventures in this direction are nearly certain to end unfavourably.

The great enemies which the landscape photographer has to contend with are wind and rain. Fog, fortunately, is not a very common foe in the season when the photographer is out and about, unless, indeed, it make its appearance on the plates themselves. We do not desire to encourage the practice of photographing upon windy or rainy days, but we are alive to the fact that to the amateur who is enjoying (?) his week or ten days' holiday, which comes but once a year, it is almost a necessity to work regardless of weather; and, knowing that in five cases out of six he *will* work, if we can say anything to lessen his probability of failure it will do good. Wind is, perhaps, the greatest foe to success, and the one most commonly encountered; it is certainly the most annoying, as it may spoil an otherwise fine day. But even in windy weather there are few places where subjects may not be selected which are not greatly affected by it. Architectural subjects, provided the camera be firmly planted, place the operator in a comparatively independent position, though in the case of an ivy-clad ruin the ivy is liable to cause some trouble. Rock studies and wild mountainous scenery, if available, form good practice for this sort of weather; but river or lake scenery is generally not to be attempted—the former usually including a large amount of foliage, while the chief beauty of the latter often depends upon the reflections, which are partially, if not wholly, spoilt by the wind. Foliage, especially if in close proximity to the camera, should be avoided in all cases, as the expedient of capping and uncapping the lens forms but an imperfect remedy. Trees or masses of foliage at a distance from the camera are not much affected, unless it be blowing a hurricane; but even then the distance and the fineness of the detail combine to render the defect scarcely noticeable.

Rain, except for the discomfort, is frequently less troublesome than wind; but under no circumstances should views including distance be attempted. To the eye the distance may be apparently clear; but the photographic plate is pretty certain to represent it in one even tint, if, indeed, it be not entirely obliterated. In mountainous districts, if it be not actually raining at the time, the presence of rain clouds in the neighbourhood generally puts a stop to distant work by enveloping the mountain tops in masses of shifting clouds. These, though frequently of a most picturesque appearance, are so changeable as to preclude all possibility of securing them except with the most rapid exposures. The best subjects, if they must be procured, will be found in sheltered nooks, under overhanging trees or rocks. Here the rain penetrates but little, and the absence of sunshine tends to remove the "hardness" of illumination usually experienced with such subjects. It is important, however, to have as little sky as possible in such pictures, as, owing to the length of exposure necessary and the great contrast between the sky and dark foliage, it is all but impossible to prevent blurring by any known means. The only consolation there is about a wet day is that wind is generally absent.

We might go on to a great length in this direction did space permit; but we have already exceeded the bounds originally intended. We have, however, said sufficient to show that there is no necessity to waste plates by recklessly "firing them off" at anything for the mere sake of exposing them, but that subjects may be found to suit almost any weather.

The value of soluble chlorides in "regenerating" foggy emulsions has been long recognised by Mr. M. Carey Lea and subsequently by others, who have recommended them in preference to bromides for the purpose, as having less injurious action upon sensitiveness. But in adopting this mode of treatment it is probable that many will, like ourselves, in some cases have failed to secure a successful result, while at other times the cure was most rapid and complete. For some time we were unable to account for this apparently irregular action, but it then struck us that Mr. Lea had specially recommended a *metallic* chloride to be used. This set us to work to test the matter, with the result that, in following Mr. Lea's directions, the wonderful renovating effect of the chloride was invariably secured in a very short time; but that if an alkaline chloride were employed it was found to be practically useless, and much inferior to a bromide. We had been previously at a loss to explain the apparent superiority of chlorine over bromine in thus removing fog; but the discovery of the difference in action between the two classes of chlorides at once effected the cure. The effect is not due to any difference in the behaviour of the chlorine and bromine, *per se*, but to an entirely distinct action of the metallic salts, analogous to the bleaching action of chloride of copper upon the developed image. Take a bromide film which has been fogged by a brief exposure to light, and, before applying the developing solution, treat separate portions of it with solutions of chlorides of copper and ammonium. Upon development the part treated with chloride of copper will be perfectly clean and free from fog, while the ammonium salt appears to have exercised no effect whatever. If two portions of a fogged emulsion be treated in a similar manner the result is the same, and is brought about by the action of the chloride of copper in rechanging to the state of haloid those portions of the sensitive material which have undergone incipient reduction so as to produce fog. Obviously it is necessary to make this correction before the emulsion is washed; but it may be interesting to know that a washed emulsion which had been accidentally exposed to light for a considerable time was so far deprived of all trace of fog as to give films which, when soaked in water and used wet or subsequently dried, produced irreproachable results. Many object to the addition of chlorides in any form to the emulsion, in which case the bromide may be substituted for the chloride of copper.

EXHIBITION OF THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

We have received the following intimation respecting the forthcoming exhibition of this Society:—

The Exhibition of the Society will be held at the Gallery of the Society of Painters in Water Colours, 5, Pall Mall East, London, S.W.

It will be inaugurated by a *conversazione*, open to members and their friends, at 8 p.m. on Tuesday evening, the 9th of October (morning dress). It will remain open daily (Sundays excepted), from 9 a.m. till dusk, until the 15th of November. The *evenings* during which the exhibition will be open will be announced subsequently.

Members will be supplied with tickets to admit their friends. An admission fee will be charged to all not provided with tickets.

Pictures for exhibition must be forwarded (carriage paid) to the Gallery, 5, Pall Mall East, S.W., addressed to the Secretary of the Photographic Society, so that they may be received *not later than* Tuesday, the 2nd of October, and accompanied by a letter of advice.

Each frame should have the artist's name and the subject written upon a label in *front*, capable of being easily detached as soon as the catalogue has been made out. No other marks should appear on the picture.

No picture in an Oxford frame will be admitted.

No picture previously exhibited in London will be admitted.

No coloured photograph will be admitted.

Not more than one frame of a dozen *carte-de-visite* or cabinet pictures can be received from any intending exhibitor.

No pictures *whatever* can be received after 2nd October—the day fixed for their reception.

A Committee of Selection will have the power of rejecting any pictures forwarded.

Bronze medals will be awarded as follows:—

Two medals—For those pictures which, in the opinion of the jury, shall display the greatest general excellence.

Two medals—For the best landscape, 10 × 8 inches and under, and for the best above 10 × 8 inches.

Two medals—For the best portrait 12 × 10 inches and under, and for the best above 12 × 10 inches.

Two medals—For the best single figure study, 12 × 10 inches and under, and for the best above 12 × 10 inches.

Two medals—For the best enlargment untouched, and for the best enlargement and *negative*, both being the work of the exhibitor.

Two medals—For the best *genre* pictures.

Two medals—For the best photo-mechanical prints.

One medal—For the best study from animal life.

Two medals—For the best instantaneous pictures.

Two medals—For the best six stereo-transparencies.

One medal—For the best frame of dry-plate photographs.

One medal—For the best microphotograph.

One medal—For the best specimen of surface printing from metal.

One medal—For apparatus.

Three medals will be placed at the disposal of the jury for any novelty or other form of excellence in process or result.

The awards will be decided by a jury consisting of seven gentlemen:—The President of the Society; two members of council; two members of the Society, not being members of council; two artists of reputation, namely:—

E. W. Cooke, R.A.
Sir J. Gilbert, R.A., President of the Society of Painters in Water Colours.
James Glaisher, F.R.S., &c., President.
Capt. Abney, R.E., F.R.S.
T. S. Davis.
Frederick Piercy.
Robert Faulkner.

No award will be made when the works in competition are not in the opinion of the jury of sufficient merit.

The competition will be open to all photographers, whether members of the Society or not, and foreign photographers are especially invited to contribute their works. H. Baden Pritchard, *Hon. Secretary.*

Photographic Society of Great Britain,
5, *Pall Mall East, S. W., 12th July,* 1877.

In connection with the above there appears a singular lack of business tact and expedition somewhere; for, while the missive itself bears the date of the 12th inst., a circular letter by which it was accompanied is dated the 17th, both being received at our office through post on the evening of the 23rd inst.—the same day on which they appear to have been posted. Dilatoriness of this kind in the discharge of official duties does not warrant us in indulging in very bright anticipations of efficiency in conducting other matters tending to render the forthcoming exhibition a very successful display—artistically and financially.

ON EXPOSURE.

In an editorial article on *How to Raise the Standard of Dry-Plate Results* I see that the Editors lay great stress upon the necessity for exercising greater care in the matter of exposure, and, while advocating a full in preference to a short exposure they deprecate the practice of trusting too much to the well-known "latitude" in that respect for which dry plates are noted. I must confess to a liking for long exposures, especially when away from home, as the surest means of securing a good result, while at the same time I am ready to believe that, given a subject under certain conditions of light, there is a special exposure which (combined, of course, with a suitable mode of development) will give the best result it is possible to obtain. But then comes the difficulty, how is that best possible exposure to be calculated?

The dry-plate man is situated very differently from the professional portraitist, or even from the wet-plate landscapist. There are so many things to consider which the former does not experience at all, and which the latter solves without much calculation by merely exposing a plate, that Mr. Amateur may well be excused if he prefer to be satisfied with a fairly good result rather than risk failure by the vain attempt at perfection. First he has to consider the actinic value of the light itself, then the nature of the subject; and here, perhaps, his valuation of the light is "knocked on the head" at once. Rocks in the foreground, foliage in the middle distance, distant mountains in the background, and sky above—each requires a different exposure, and the problem is how to suit them all.

It is plainly impossible to give to each portion of the picture its due exposure, so the only course is to allow such a time as may be judged to suffice for the darkest parts (probably the foreground), leaving the distance, in a manner of speaking, to take care of itself; and the "best possible exposure" is just such a length of time as will serve to impress the foreground without permitting the distance to be so much overdone as to be beyond the bounds of management during the development. If we fail to hit the exact time a little consideration will show that a very slight error on the side of under-exposure will produce much more serious results than a greater error in the opposite direction; for the feebly-lighted portion being underdone requires forcing on development, and the already over-impressed distance acquires the effect of still greater exposure. If, on the other hand, the time allowed be slightly in excess of what is really necessary for the foreground, the distance, which has already received a much longer exposure than it requires, will not suffer materially from a comparatively slight addition; and, as the feebly-lighted portions require less attention during development and no pushing, there is greater scope for curbing the activity of the developer in those portions which require it.

Turning from exposure to development, we find there is a very great amount of judgment necessary in order to produce the best result, not only with a given exposure, but also with a given class of subject. Most of those who have worked dry plates for even a short time will be perfectly familiar with the proper methods of treatment for plates which are obviously under- or over-exposed; but I am afraid that comparatively little attention is given to the equally important points connected with variations in the nature of the subject. From this cause it results that many a negative which in the early stage of development promises well, gradually "goes to the bad" as the operation progresses, simply owing to ignorance of the proper treatment required; for it is quite possible that two plates may be exactly equal as regards correctness of timing, and yet require totally different development. For this reason it is of the greatest importance to note, before commencing to develope, the class of subject to be operated upon, and to proceed accordingly. If subsequently it prove that the exposure has been wrong, an entirely distinct set of rules come into operation in performing the necessary correction.

In speaking of the variations in development necessary with different subjects I may divide the latter into three general classes:—1. Well-lighted, open views in which the natural gradations of light and shade present a harmonious result. 2. Subjects possessing excessive contrasts. 3. Subjects devoid of contrast. In addition to these I may mention dimly-lighted subjects, such as interiors, dark ravines, or heavily-wooded forest scenes, which are, however, so modified by attendant circumstances as to be beyond the possibility of treatment in an article of this sort. Before commencing to describe the different modes of treatment I must premise that the subjects are supposed to have received, let me say, a *suitable* exposure, as I do not intend to enter into complications arising from errors in timing. In forming a judgment of the character of the subject as regards light and shade the appearance of the image upon the ground glass will generally be sufficient guide; but a valuable aid in this direction is a small piece of deep orange glass through which to view the landscape, when the lights and shadows present themselves to the eye in something more like the manner in which they will be depicted upon the plate. A somewhat similar result is obtained by partially closing the eyes, so as to greatly diminish the apparent illumination. Either of these methods will bring out distinctly shadows which are almost invisible to the unaided eye, and which, by escaping notice, might possibly spoil the picture.

The first class of subject is probably the one most generally encountered, or, perhaps more correctly speaking, the most generally chosen, for unconsciously to himself experience has educated the photographer to select the subjects with which he achieves the greatest amount of success. This class, indeed, presents no difficulties, and needs no special treatment. Almost any form of development (within reason, of course) is successful, as nature, aided by a judicious exposure, performs the task of forming the due gradations of light and shade.

As a type of the second class of subjects (those presenting considerable contrast), I may take such an one as that pictured in the earlier portion of this article—a foreground of dark rocks and foliage perhaps in shadow, middle distance foliage well lighted, and a background of distant mountains in sunshine, the whole forming a subject of anything but an inviting nature to a photographer who is in the habit of treating all his plates alike. The object in such a case as this is to keep down the density of the distance until the foreground is secured. It is worse than useless to attempt to retard its *development*, as any efforts in that direction only tell with double force upon the worse-lighted parts. The end is secured by keeping down the strength both of the pyro. and ammonia, especially the latter, using no more restrainer than is necessary to prevent fog in what may be a rather long development. Pour the solution chiefly on the foreground, allowing it to flow now and then over the whole plate so as to avoid irregularity; and, should the detail be long in appearing, exercise patience rather than increase the strength of the ammonia, the effect of which is to render the distance thick and heavy, and scarcely distinguishable from the sky. The thin, apparently flat image produced in this manner is then intensified with silver up to any degree of vigour.

Under class 3 I may place landscapes or architecture under a cloudy sky or in sunshine, with the sun immediately behind the camera. In order to increase the contrasts by making the most of what little shadows there may be the ammonia must be reduced to a minimum, and the full strength (three grains to the ounce) of pyro. In this manner the better-lighted portions which develope first have time to acquire some strength in the strong pyro. before the shadows are brought out by the weak ammonia, and when the latter are out the intensification may be performed either by adding the full strength of ammonia and bromide or by means of acid pyro. and silver.

It is worthy of note here that blurring or halation is much more likely to make its appearance under a leaden sky than in a well-lighted view, and when the tendency exists it is further promoted by extremes of development. If the alkali be weak the long development produces it, while under opposite conditions the powerful reducing action of the strong ammonia is the cause; the appearance, however, is entirely different in the two cases. With a rapid development and medium strength of solution it is very rarely met with.

It will be noticed that I make no mention of the actual strength of the ammonia to be employed. I have made this omission advisedly, as the strength varies with different processes; indeed, in my own case, working as I generally do to the same formula, I frequently find that different samples of emulsion require very different treatment. I experience no difficulty, however, from that cause, as I can judge from the behaviour of the first plate how to treat the remainder. This article is necessarily somewhat incomplete, but my principal object is to call attention to the necessity for varying the development to suit the subject as well as the exposure. W. B. Bolton.

BROMISED COLLODION PROCESS—DRY AND WET.*

In using emulsions and bromised collodion, which require a large quantity of pyroxyline in the collodion in order to retain the bromide of silver which is abundantly formed, blisters frequently occur. This is generally due to the following causes:—Damp interposed between the glass and the film; the presence of an acid, although very weak, in the water used for washing or in the preservative; too great a thickness of collodion being accumulated at the edges of the plate; heating the glass before or after being collodionised. These are generally the causes which lead to failure. Such blisterings, or non-adhesion of the film, can generally be avoided by applying talc to the margin of the plates, whether for wet or dry collodion; the omission of acids for washing and also from the preservative; very little accumulation of collodion at the margin of the plate, and also at the corner from which it is drained.

Remarks and Observations.

For the emulsion and other bromised collodion processes, when the alkaline developer is used, it is necessary that all the operations be conducted with alkaline substances until the image is fixed.

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* Concluded from page 330.

When we employ the alkaline developer the best substratum is india-rubber varnish. For the acid developer we use albumen, but in order to obtain great purity combined with rapidity it is preferable that no substratum whatever be employed, but that the edges of the film be varnished with india-rubber before developing. It assists the sensitiveness, and gives regularity to the bromised collodion, to add a few drops of alcoholic tincture of bromine, chloride of bromine, chloride of zinc, or chlorides of zinc and bromine mixed, dissolved in alcohol. We avoid, also, the patches of unequal sensitiveness in the silver baths which manifest themself so frequently. A neutral collodion gives bad results as regards sensitiveness, and the film assumes the appearance of marble in the silver bath.

In order to clarify bromised collodion it is necessary to add a little kaolin. It should then be shaken and allowed to settle.

The collodion, for the dry processes, should be by preference composed of ether and alcohol in equal portions, and the cotton be of a friable nature, so that it may be more porous and less contractile.

The relation existing between the silver bath and the bromine contained in the collodion should be about one to seven; that is to say, for a bromised collodion of two per 100 the sensitising bath should be fourteen per 100, without which the bromide of silver is less sensitive. The quantity of gun-cotton ought to be a little less than the bromide. It is indispensable in the bromised process that, in order to avoid fogginess, the whole of the manipulations should be performed in a very feeble non-actinic light; the direct light of a candle falling on a plate from a short distance will fog the film. In order to overcome this enclose a small lamp in a lantern with a yellow glass in front, or otherwise paste yellow paper over a white glass.

In order to obtain extreme sensitiveness with the bromide films it is necessary that all the substances employed for the different operations be perfectly neutral or, preferably, slightly alkaline. A minute trace of acid not only retards the chemical powers of light, but permits of a long exposure being given, the results in such a case usually being negatives of surprising clearness and brilliancy.

Tannin, which gives excellent results with sensitive films of iodide of silver or bromo-iodide of silver, does not give very good results when the bromide of silver is pure. It has a great affinity for iodine, but its affinity for bromine is very feeble.

Since the introduction of dry bromised collodion the progress has not been of a very marked character. Preservatives of the same nature are used, all acting in the same way; that is to say, absorbing the iodine and bromine liberated by the action of the light at the time of exposure for the purpose of facilitating the development, and without exerting a chemical action on the sensitive silver salts.

In conclusion: the processes involving the use of bromide of silver still present great difficulties. They are very inconstant; but up to the present time they are the only methods that approach instantaneity on dry preparations. Still, I am convinced that by investigation and careful experiments the iodide-of-silver process can be brought to very high perfection. Such is the result of my experience. I make no pretensions to having taught anything of a new character; but, comparing the qualities of the different processes, have given them their respective values.

—*Le Moniteur de la Photographie.* ERNEST BOIVEN.

NOTES ON OPAL GLASS AND PORCELAIN.

No. 1.

FOR many years opal glass pictures have been a favourite style with photographers, their beautiful purity and delicacy, when well executed, rendering them attractive to everyone. Some years ago they were in great demand, everyone doing opals till the fashion palled. At last their production fell into a steady channel, some establishments ceasing to push or even produce them, and others taking the lead in this class of work and becoming specially noted for it. One or two leading metropolitan studios have for many years been engaged in producing this style of picture in preference to every other. I have written upon opal pictures before, narrating some difficulties that I had experienced with the material itself, and as I have produced a fair amount of these pictures, I think some further notes and explanations will be acceptable.

Opal glass is to be obtained of two kinds—"pot-metal" and flashed. The former is of uniform consistency throughout its substance; the latter is clear glass coated or "flashed" with a thin stratum of the white glass. At first sight they would be pronounced to be alike in appearance, but closer examination would show a marked difference between the two. The pot-metal is more like porcelain or, perhaps, ivory (except in colour), having a semi-translucent appearance; and the "flashed" is scarcely different from white paper in appearance, the thin coating having to be so very opaque and solid to get the perfect whiteness no effect of translucency is obtained. Again: the two kinds may be obtained either as patent plate or sheet, and, finally, with either a plain or a roughened surface.

The latter is the variety most in favour with photographers, and the one which has presented many difficulties; unless the context shows to the contrary, it is the kind I shall be speaking of in my succeeding remarks. If any photographer have a pile or packet of these glasses that have been in stock for any length of time he would not be satisfied with the appearance they presented upon examination. At the edges he would perceive a dirty-brown stain, gradually lightening as it approached the middles of the plates; and no amount of rubbing or treatment of the ordinary kind will affect it. This at the beginning is a drawback, assuming, as I do, that ultimate permanency is always aimed at in all pictures. It is rather an uncomfortable idea that the very glass itself—which is usually looked upon as a most permanent material—should be liable to fade or change, apart from any permanency or its opposite in the photograph itself. A further examination of any case of specimens or framed pictures on opal which have been produced for any length of time would, in the majority of cases, not tend to reassure him, a distinct degradation of tone being perceptible, which would be still more noticable if the picture were taken out of its frame and examined. Now, as paper itself, properly treated, under similar circumstances, retains its whiteness, it is evident that whatever alteration has taken place must be either through internal change in the glass itself or be induced by atmospheric influences; and that the latter is the cause is seen when it is remembered that in the interior of the packet of glass, where the air penetrates little if at all, the glass does not change its colour. Hence we decide that the glass must become discoloured through the action of the atmosphere upon it. The next step is to ascertain what that change can be. The whiteness of the opal glass being the only quality apparently that distinguishes it from other glasses, one might expect that if we knew what was the origin of the whiteness we might predict the cause of the stain; but the milky hue being caused by phosphate of lime, it is evident that that chemical cannot be the faulty substance.

Being determined to arrive at the cause I tried a few experiments, which have been so significant as to leave me entirely free from doubt regarding the origin of the stain. The only ingredient entering into glass which would be likely to change is the lead, which might alter in colour if the surface of the plate were sufficiently disintegrated to allow of the action of the sulphuretted hydrogen present in the atmosphere of all towns. The fact of the surface being roughtened facilitates the action of the gas by increasing the actual surface offered to it, and the circumstance of the glass being white would render visible an infinitesimal amount of change, to estimate which would be quite beyond reach of the balance.

The first step was to ascertain if any lead entered into the composition of the glass, which was affirmatively shown in a moment by a stain, deep to opacity, which was instantly produced upon directing the point of the reducing flame of the blowpipe upon a thin slip. The same blackening was, either upon the pot-metal or the flashed glass, shown upon the transparent portion as well as the white coating. I cut off a slip of the stained glass, and boiled it for ten minutes in dilute nitric acid. This produced a decided effect, but did not entirely remove the discolouration, and, so far, was not entirely confirmatory of the hypothesis of its being sulphide of lead; but upon substituting strong acid and boiling, the stain was instantly removed. These facts were conclusive enough as to the presence of lead. Still more to increase certainty, however, I placed a strip of the glass free from colour in sulphuretted hydrogen water. A minute's immersion only served to distinctly darken the surface.

These facts, I think, will not leave doubt in anyone's mind as to the cause of the staining, which must be familiar enough to all who have used opal glass. The reflection is very disagreeable to an honourable man that all the beautiful pictures we have so much admired must gradually lose their beauty through the discolouring of the medium upon which they are photographed, though all possible pains may have been taken to ensure the permanency of the image by adopting the carbon process, or, if silver, scrupulously abstaining from adopting mercury in aid of toning, notwithstanding the meretricious and evanescent beauty of its tones. The disagreeableness of this reflection is still further intensified by the remembrance that some of the most expensive paintings produced upon a photographic basis have been upon this deceitful surface.

The question next arises—Can this discolouration be stayed? If not, will it continue to complete blackness, or will a point arrive beyond which it will not pass? To reply to the latter: I would say that I should think the rapidity with which the darkening proceeds would, after a certain point had been reached, decidedly diminish, though it is difficult to say what depth the stain would reach before that point was touched. Far better would it be to endeavour to prevent or arrest the stains entirely.

G. Watmough Webster, F.C.S.

PHOTOGRAPHY AT THE WAR.

"We have lost our way, old fellow; do you think you can find it?" This remark was addressed to my horse, who gave his head a tremendous shake and immediately started off. After riding for about a quarter of an hour, very much down hill, I found the road led to a forest. Among its shades I espied an European dress with a man inside. Hailing him at the top of my voice he answered, with a shout that awoke the echoes, "Hollo! What do you want?" There was no mistake—it really was an Englishman! Talk of finding poor Livingstone! I doubt whether Stanley felt half the joy I experienced in making this discovery. As soon as we had arrived at speaking distance I explained that I had lost my way, and inquired if he could direct me to the shore of the Bosphorus. "Yes, I think I can." "Good," I said; "but what have you there?" I added, pointing to some black packages on the ground, which bore a strong resemblance to those I was carrying. "Why," said he, "these are my photographic traps." Fancy this—a real live photographer! I could not refrain from laughing heartily, which made him inquire the cause of my mirth. I explained that I was a photographer myself, and following with a few more explanations we speedily became friends.

Having unfastened his horse from a tree we started for the shore of the Bosphorus at once. In the course of conversation I found he was a resident in the country, and employed his holidays in wandering about the mountains taking views of forest scenery, this being his first trip. Upon inquiring what process he used, he replied that a friend had supplied him with apparatus and some Beechey dry plates. He said he had worked the wet process in England some years ago, but he was now operating with dry plates in the hope of avoiding the evils arising from the silver bath in hot climates.

This gentleman courteously invited me to his house to witness the development of his plates; and, as he resided in Pera, I accepted his invitation. Arriving home safely at last I was very glad to turn in and get some rest.

I started off the next morning up the Golden Horn, my friend having informed me there were several beautiful subjects for the camera in the shape of some historical buildings. Passing the Turkish dockyard I very much wished to photograph the steamer in which Hobart Pasha made his celebrated run down the Danube. This could not be done without the permission of the Turkish authorities, which would take about five days to obtain, and also cost a few liras. Finding this impossible for the present I crossed to Stamboul, and made up my mind to visit the ancient walls of Constantinople. Seeing these for the first time, they impress the beholder as being one of the most gigantic works of man—in fact, only to be surpassed by the great wall of China.

Determined to get a view of these walls, I had focussed, and the exposure was going on when four of the Turkish police appeared on the scene. They walked round and round the camera, and, when they had completed their inspection, what I should suppose was the serjeant inquired in French if I had permission from the Porte to use that machine, as they had strict orders to apprehend anyone who attempted to take surveys in the neighbourhood. I explained that I was not surveying, but really photographing. He said that was even worse, and that if I gave up the apparatus he would be contented with my name and address and not put me to the inconvenience of arrest. I endeavoured to bribe this worthy man—in fact, I went so far as as to offer him a napoleon. Even this he was proof against; indeed, he was quite as incorruptible as our London police. He informed me that he would have to send the apparatus to the office of the Minister of the Interior for his inspection, but I could have it again with that gentleman's permission. Further argument being useless I locked my dark slide, and they walked off with the apparatus. This was rather a bad beginning to my morning's work; but I determined to make some sketches, having material with me in case of accidents. Riding some twenty miles, making sketches of various points of interest on the road, and visiting the Greek church, which contains the *Miraculous Fishes*, I now determined to return homewards. Passing through a cemetery which embraced both sides of a narrow road, and was made dark and gloomy by the stately cypress trees, five Bashi Bazouks appeared in the distance. As I approached them, one who carried a heavy stick in his hand struck my horse a smart blow below the knees, which threw him down and me over his head. In an instant they all pounced upon me and rifled my pockets of their contents. Of course I objected to this, and, struggling, regained my feet. Putting my hand into my belt I drew my revolver and fired, knocking one fellow over at the first shot. During all this my poor horse had stood quiet and trembling. I now jumped upon his back, and we both kept up the family reputation for speed. I do not think I should have lived to write this article if these gentry had not been so busy sharing the spoil between them.

In my next I hope to be able to give some *data* as to the behaviour of Warnerke's tissue in the East. Edward Pocock,

Artist for the London Stereoscopic Company.

PAPER NEGATIVES.

Notwithstanding the general desire so frequently expressed, and the many experiments made with a view to find a substitute for glass in the production of negatives, and in spite, also, of the fact that it has been abundantly demonstrated that work of the highest class may be made with an emulsion spread on a film of alternate layers of gelatine and rubber, glass plates are in almost universal use, with all their liability to breakage, and inconvenience and also cost from accumulation. To the professional photographer this is not, perhaps, a matter for serious consideration. He includes in his calculations the price of the glass on which he works, and has, as a rule, such convenience for storing his negatives that their accumulation is not a serious drawback, but rather, indeed, an advantage if the prospect of his business some day coming into the market be taken into consideration. With the amateur, especially with those who have a preference for plates of a tolerably large size, it is a very different matter—an inconvenience which makes itself both felt and heard, particularly at this period of the year.

In addition to the inconvenience and risk of storing negatives of (say) 12 × 10, the cost of such plates is, to the amateur of limited means, a serious drawback; and he is constrained, as the season for work or the holiday time comes round, to overhaul his stock and select for washing off numerous negatives that are, in many instances, painful to part with. No doubt some one will ask—"Why not transfer the films?" It is true that this may be easily done, or, rather, is easily done, by some who are accustomed to the work; but there are difficulties in the way. The use of a substratum is almost inimical to success, and I suppose there are now few operators who do not use one. Then, again, the film should not be varnished; for, as printing from unvarnished negatives is a dangerous proceeding, that means either occupying a portion of the frequently too brief time which can be given to photography in transferring, or else waiting till the end of the season before seeing a print.

From some experiments made during the past week I am induced to believe that the simplest and most satisfactory way to overcome the difficulty is to make paper negatives from every plate that is to be washed off, or, perhaps, I should rather say that, with a very little care, negatives may be made on paper from every photograph worth keeping that will give prints quite equal to the original, so that the accumulation of glass may be prevented altogether. In common with, I suppose, most photographers I had long been possessed of the idea that although a paper negative, from a presumed inherent granular structure, gave prints of certain artistic excellence and breadth of effect, they were wanting in that delicacy of detail and peculiar sharpness so much admired in prints from negatives on glass; but, on looking over an album of prints from waxed-paper negatives a short time ago, and comparing them side by side with a fine collection of wet collodion pictures by the same operator, the half-admired but more than half-feared structure was nowhere visible.

No doubt there are many things recommended by somewhat too enthusiastic experimentalists that are not worth a serious trial; but there are also quite as many which receive little more than a passing notice that are well worth adopting, and I think the production of paper negatives is a good example of the latter class. I had again and again seen such a proceeding recommended, but the bogle, granulation, stood in the way until an examination of the waxed-paper prints induced me to give it a trial. The result lies before me in the shape of a few prints from both paper and glass, and it is quite impossible to distinguish the one from the other.

I may say that several methods of procedure were tried and various kinds of paper used; but, knowing well the dislike that photographers have to any unnecessary additions to their *materia photographica*, I was pleased to find that the best results were obtained with such material as is always at hand, and with no addition other than a little white wax or paraffine. A piece of ordinary albumenised paper is sensitised in the usual way (and there seems to be no difference in the results whether it be the thick or thin variety); it is placed on the negative in a well-made printing-frame capable of keeping the two in perfect contact—the plain side, that on which the albumen is not, being next the negative. The printing is best done in direct sunlight, and should be carried considerably deeper than in ordinary work. The print, which appears much more in the body of the paper than when printed in the ordinary way, is washed and slightly toned to a warm brown, fixed, and when dry made transparent by one of the methods to be mentioned by and by. We have now a brilliant positive or transparency, and all that is required to produce an equally brilliant negative is to repeat the process, using this transparency instead of the negative previously employed.

For the information of those who have joined the ranks since the days of waxed paper, and who do not know how to wax a sheet, I may say that it is simply done as follows:—A sheet of tinned iron is placed over a Bunsen burner or spirit lamp, and a piece of white wax or paraffine laid in the centre. As the wax melts it is spread over the tin, and then the negative or transparency is held by the corners and laid on it, just as if laying it on the silver bath. As soon as the paper is saturated it is lifted up, and when cold is placed between sheets of blotting-paper, and pressed with a hot iron. The blotting-paper absorbs all superfluous wax, and leaves the paper in a semi-transparent state, through which light passes readily. If paraffine be used instead of wax a few drops of castor oil may be added with advantage, as it gives greater pliability to the paper. A less troublesome and equally efficient method of waxing is to dissolve wax in benzole, and by means of a brush apply the solution freely to both sides of the paper. When the benzole has evaporated the sheets must be ironed between sheets of blotting-paper, and the requisite transparency will be at once secured.

Negatives thus obtained will give prints in every respect equal to what can be got from the original, and they possess many advantages over those on glass. They may be stored in hundreds in a portfolio; are not liable to breakage either in the frame or from accident; and they, as well as the positives from which they are made, afford much facility for retouching to those who think that an improvement. JOHN NICOL, Ph. D.

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A NEW YORK PHOTOGRAPHIC STORE.

THE following description of the store of Messrs. E. and H. T. Anthony and Co. is extracted from the *Southern Pathfinder* of the 7th inst.:—

PROGRESS is the order of the day. But progress implies change; and photography, though one of the younger arts, has proved quite as susceptible of ceaseless modification and improvement as many of the older and less interesting ones. Many years ago, in the infancy of the then new discovery, an article appeared in the magazines, by Professor Oliver Wendell Holmes, who conceived the details of the preparation and manufacture of materials connected with photography by the above-mentioned house to be of sufficient importance to enlist the service of his graphic pen.

Photography in that day was deeply interesting and delightfully novel, but compared with the present it was, as it were, but the embryo of future possibilities. To follow in detail the upward course of the art in all those fleeting years would be foreign to the purpose of these lines, though undoubtedly many of the advances made are due to superiority of the provided means and supplies as well as to improved methods. Our object is rather to describe generally the manufactures and premises of the firm today in their several establishments in New York and elsewhere.

In addition to the materials requisite for the practice of photography there are many collateral manufactures more or less nearly allied with it; such, for instance, as the making of albums, the printing of stereoscopic prints and portraits, the manufacture of stereoscopes and the recently-introduced graphoscope, the production of beautiful transparencies for the window (which have lately become so popular) and for use in the magic lantern, the making of velvet *passe-partouts*, frames and cases as settings for portraits, and the manufacture of the magic lantern in all its more modern excellence and variety.

The manufactures specially connected with photography embrace those of pyroxyline, collodions, varnishes, and other compounds, a great variety of chemicals (which require to be exceptionally pure and determinate in character), the albumenising of photographic papers, and the manufacture of *camera obscuras*, apparatus, and accessories of the photographic studio.

It will be very readily seen that the successful production of all these varied materials requires correspondingly diversified knowledge and skill. Chemistry, mechanics, and a certain estimate of the necessities of the trade are alike indispensable, and finally a large endowment of tact and unremitting industry to mould these factors into congruous unity and use.

Some of these results have only been achieved by a long and systematic course of experiments, especially in the combination of many photographic compounds and the fabrication of their components. So delicate and important are some of these that the slightest deviation from a prescribed formula would result in ruin to reputation and severe loss. The duty of determining these proportions devolves upon Mr. H. T. Anthony.

Besides the large and commodious buildings united at Nos. 591, Broadway, and 164, Mercer-street, where those splendid products of the camera, photographic transparencies, are made, Messrs. Anthony occupy five distinct factories, or workshops, two of them in New York city (one over the freight depôt of the New Haven and Harlem Railroad in Centre-street, and the other over the premises of the Adams Express Company, at No. 65, Broadway), and three in West End, New Jersey, where a considerable parcel of land is held in reserve for future emergencies.

In the Franklin-street factory (over the freight depôt) there are printing presses, binders' presses, cutting machines, &c. Here are seen printing and embossing of album covers in endless variety of styles and all stages of advancement. Some of the operations of these machines are very interesting; so also are those of the printing presses, which not only beautifully print the "insides" for albums, but punch or perforate the openings at the same time. Here also are cut and trimmed immense quantities of straw board, cardboard, and paper for the various departments.

The Factory at No. 65, Broadway.—In this spacious building (40 × 220 feet in extent) and on three successive floors are seen crowds of busy hands. The lower floor is entirely devoted to the selection, trimming, mounting, and labelling of stereoscopic views, the manufacture of velvet frames and *passe-partouts*, photographic cases, stereoscopes, the gilding of albums, &c. In one direction may be seen a number of workers—male and female, old and young—with dexterous fingers fitting and filing, nailing and punching, glueing and uniting the various parts of the stereoscope—that simple little instrument which reveals so much. Of these there is a large variety adapted to every caprice. Still further on are others engaged in arranging in tasteful forms those delicate velvet frames which, with their blue and violet and many-coloured trimmings, are so well adapted to the now-popular photochrome and similar pictures. Here, too, are made those charming little oval velvet cases, so nice for miniatures, and all the more staple goods in that line.

Opposite are a bevy of girls assigned to the care of stereoscopic views. There is something fitting in this, for standing among these weird little waifs of the camera they follow in almost fabulous succession, appealing with powerful effect to the imagination. First may come a representation of the streets of New York, then a view down the Bay or a glimpse of the Central Park; then, perhaps, the majestic Niagara, the Yosemite, our East River Bridge or the island of Juan Fernandez, the princely elegance of Paris or a panoramic view of Jerusalem—the Holy City.

Next above the space is mainly devoted to the albumenising of photographic paper—one of the more important if not romantic sub-divisions of the business. The labour of mounting, or stretching and varnishing, of chromos is also assigned to this floor.

The upper floor is mainly appropriated by the album makers. Here may be seen the process called "album building," by which the "insides" are "built up" from simple sheets of printed and perforated boards into albums of different sizes and styles, afterwards to be covered, and the edges gilded and chased.

West End.—From No. 65, Broadway, to reach their West End factories in New Jersey, it will be necessary to take the steam cars in Jersey City, and after a five-minutes' ride and a four-minutes' walk we arrive there. The smaller building (30 × 35) with the large chimney, to the north of the enclosure, is wholly devoted to the manufacture of what is commonly known as gun-cotton—a soluble pyroxyline for the preparation of photographic collodions, together with some of lower grade for other commercial purposes. Here the carded cotton may be seen immersed in certain proportions of nitric and sulphuric acid at a high temperature, after which it is removed with glass rods to earthen tanks for cleansing. It is then removed to the drying room—another building (20 × 30) some distance westward—where it is spread on shelves to dry.

Between the two last-mentioned buildings there is another (30 × 70), divided by a party-wall into compartments—one for the manufacture, bottling, and packing of collodion and ether, and the other similarly for photographic varnishes.

In the main building (50 × 80) the lower floor constitutes the laboratory, wherein the more important chemicals are made, as well as the refining of photographic residues, &c. The floor above is occupied for toning and fixing photographic prints—operations which require the exercise of much judgment. In the loft above are stored thousands of negatives; whilst the upper one is given exclusively to printing from these negatives. Skill, neatness, regularity, and order are indespensable in this department. From this building the prints are transferred to No. 65, Broadway.

The Store, No. 591, *Broadway.*—The business of the firm (or rather company, incorporated April 1, 1877) is now conducted at No. 591, Broadway, extending to and including No. 164, Mercer-street. The lower floor (front) is occupied solely with and for the sale of stereoscopes and views, lanterns and slides, and portraits of celebrities; the middle portion for the sale of photographic materials, and the rear for packing and shipping.

The next floor above (front) is reserved for the sale of chromos, engravings, photographs, albums, and an almost endless variety of frames, mouldings, &c. It is elegantly fitted with oil paintings, chromos, transparencies, and kindred articles, and is a favourite resort for persons of taste and leisure. On the floor above are stored *passe-partouts*, frames, albums, and chromos, where they are also prepared for shipment. The upper floor is devoted to the making of photographic transparencies, a department for the finishing and framing of pictures, and a goodly assortment of larger frames. In the rear building, above the store, are, first, a room for the preparation of orders for chemicals, glassware, &c. Above are kept apparatus and materials for the photographer. In the upper loft are stored hogsheads and crates of porcelain ware, barrels and tierces of glassware, boxes of apparatus, &c., a portion of it being divided into a room for the preparation and arrangement of lantern outfits and experiments connected therewith. Immediately below the latter is a compartment reserved expressly for the purpose of making chemical analyses and experiments.

It is impossible, in a brief sketch like the foregoing, to convey an adequate idea of the extent or variety of details which this establishment has directly under its management; but there are many other departments, with large interests involved, which are engaged in the manufacture of the less important requisites of the trade *exclusively* for this leading house, and solely dependent on its patronage. Nowhere, perhaps, in either of the great centres of traffic can there be found so complete or renowned an emporium for the sale and manufacture of materials connected with the photographic art.

Contemporary Press.

PHOTOGRAPHIC ACCIDENTS.

[Philadelphia Photographer.]

Many of the failures in photography are said to be accidental, or result from some cause apparently unforeseen by the operator. This may be really true in some cases, but many of the so-called accidents are due to a want of care in the preliminary parts of the work. They may occur in compounding the chemicals, in manipulating, or in finishing. Even in the æsthetic department—where it is supposed the photographer has all before his eyes and under control—some defect in composition, pose, or lighting is said to have been *accidentally* overlooked. But an accident that occurs in this way is no accident; it is rather an evidence of carelessness or a want of training on the part of the operator. No one is to be censured for being the victim of this carelessness or inefficiency, for it is human—it is something to which we are all liable; but he who fails to profit by such lessons wrongs himself and loses all the advantages that come from improvement and progress.

I may enumerate some of the accidents that are most common to our everyday work. In preparing the negative bath the operator *accidentally* slops in fifty drops of nitric acid where he only intended to put in five, and the consequence is, in the absence of collodion, &c., prepared for an *acid bath,* his negatives are sadly under-timed and wanting in detail. In coating his plates he *accidentally* leaves his collodion bottle uncorked *every time;* this accident often grows into a fixed habit that is hard to break off. The consequence is the evaporation of the ether soon causes the collodion to become thick and wavy; crapy films with various attendant evils are the result. The prepared plate is placed in the holder, taken under the light, and set down against the camera-stand or any convenient leaning place while the sitter is being posed; *accidentally* the plate-holder is knocked over, and the negative comes out filled with spots and pinholes. The negative may be otherwise so good that the photographer concludes to keep it, and those blotches are for ever an eyesore to him as well as to all others who may examine the picture. This accident, or a recurrence of it, may be avoided by providing a box or stand in or upon which the plate-holder may be placed, or it may be laid flat upon the floor, a table, or shelf, so that the film side of the plate will be *down.* In this way it is safe, as "he that is down need fear no fall." In flowing the plate with developer the bottle is *accidentally* tipped too much, and solution enough for half-a-dozen plates is splashed into the sink, carrying with it all the free nitrate of silver on the surface which was so necessary to the proper development of the image. The consequence is a weak, imperfect negative, the inferior qualities of which seriously affect the resulting picture.

In manipulating about the dark room hypo. solution is *accidentally* spilled or dripped upon the floor. This happens from day to day till a sufficient quantity has accumulated to form a crystallised coating, which, becoming ground up by the feet, forms an impalpable dust that settles upon and fills with pinholes every plate prepared.

The bath is *accidentally* left uncovered at night, so that dust—probably the same dust just referred to—accumulates upon the surface; and in the morning, by another *accident* of memory, or neglect, this disagreeable scum is not removed, and is taken out on the plates a little at a time, to mar the work and perplex the operator nearly all the day through.

By *accident* the filter which has been used for the bath, by being placed in close proximity to the hypo., the developer, or the ammonia bottle, becomes contaminated with one or the other of these enemies to the good behaviour of the bath, and after it has been renovated, filtered, &c., the luckless photographer, at a time when he expects all to go well, finds himself, or more particularly his work, hopelessly obscured in fog. This fogging may also occur from keeping a bottle of ammonia in the dark room, which, from the heat of summer without, or from that of winter within, accidentally forces out the stopper and fills the apartment with its fumes.

Under the skylight such *accidents* as getting the wrong view of the face; letting the head be too high or too low; allowing the sitter to look nowhere; giving the eyes a wrong direction or bad expression; leaving the hands to take care of themselves, instead of carefully placing them in graceful and expressive positions; blundering against the camera and upsetting it in an intense study of effects, thereby frightening the sitter, or making the whole performance seem such a burlesque as to render an agreeable or happy expression afterwards difficult to secure; getting too much top light for one style of features, and too much side light for another; over-exposing on a bright day, and under-exposing on a dull one; missing the focus, because it was too much trouble to use the glass or adjust the swing-back; making the exposure without having the dark slide drawn, thereby necessitating a second sitting with its diminished chances of success.

All these accidents are liable to occur, and most photographers of experience have, doubtless, met with some of them. Many are disposed to call these adverse incidents "bad luck," or unforeseen circumstances over which they had no control, and there let the matter rest without any consideration as to whether or how they might remedy the evil. There is very little of that "scapegoat" called "luck" in existence. The more correct terms for "good luck" or "bad luck," are "good management" or "bad management;" it is at least so in photography. The man who looks every failure square in the face, and turns inwardly upon himself and his own resources to find the remedy, is he who will soonest conquer himself, and, in doing this, conquer nearly all other difficulties.

The *accidents* I have referred to, without saying how they may be avoided, are such as suggest their own remedy. The *cause* of a difficulty is often the most suggestive of a cure. For instance: if you drop a negative and break it, the lesson to be learned is not how you may mend the broken plate, but the accident itself is a warning to be more careful in the future. Robert J. Chute.

Our Editorial Table.

Design and Work. Vol. II.

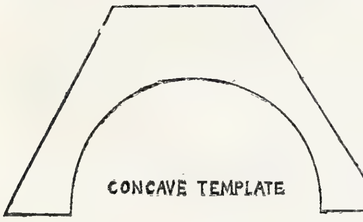
London: G. Purkess.

Design and Work, of which we have received the second half-yearly volume, is a publication calculated to educate its readers in the rudiments of mechanics, chemistry, and physics, and judging from the volume now before us it makes a successful effort in this direction. It "goes in" for a great variety of topics, which may be classed under the general headings, and in each number the system of having one correspondent to answer the queries of another is adopted. The subjects treated are too multifarious for us to afford an adequate idea of them by any attempt at enumeration; but among them are several in which photographers are believed to have an interest. Photography itself comes in for a share of attention—of course from the rudimentary point of view; but whether such contributors as Mr. W. H. Hall, who after giving strangely misleading information concerning the dimensions of plates, then advises the purchase of a double-convex lens which will cost sixpence (!)—*vide* page 398—whether such, we say, are to be hailed as teachers in the art of photography we leave our readers to judge. It is only fair, however, to add that much thoroughly reliable matter in connection with photography is to be found in these pages.

The book is an excellent one for imparting—especially to young readers—an idea of what is going on in the world of mechanics and physics, and we know of few serials that we would with more pleasure put into the hands of an intelligent young man, who will find in it a great deal to delight him.

There is, of course, much in the volume that will prove of interest to the adult as well as to the juvenile mind, and we extract the following article, by an anonymous contributor, on the grinding of lenses as one that is fairly representative of the higher class of articles to be found in the pages of our youthful contemporary :—

THE grinding of lenses of moderate apertures is a work that may be without much difficulty performed by a skilful amateur. No one, however, need attempt the task who has not a fairly good lathe, and who is not sufficiently expert in turning brass, &c., to construct with ease and accuracy the grinding and polishing tools hereafter to be described. Before proceeding to the actual mechanical work of making a lens, the operator must know what curvature of surface is necessary to form a lens of any given length of focus. A plano-convex lens, *fig.* 1, has a focal length equal to twice the radius of the curved surface; that is, supposing the radius of the curve to be three inches, the focus of the lens would be six inches. In a double-convex lens, *fig.* 2, the focal distance is equal to the radius, and in the case of a crossed lens, *i.e.*, a lens with surfaces of unequal curvature, the rule for finding the focal distance is—"multiply the radius of one surface by the radius of the other, and divide twice the product by the sum of the radio;" *e.g.* What is the focal length of a lens whose radii are two inches and four inches respectively? 2 × 4 = 8, the product of the radii, which, doubled, is sixteen; divide this by the sum (2 × 4 = 6), and the required focal length will come out 2·666 inches, or 2$\frac{7}{10}$ inches nearly. The above rules must not be taken as mathematically exact, but are very nearly true for plate and crown glass; but to go into the question of differences in the refractive qualities of glass would needlessly complicate the problem. Concave lenses follow the same rules.



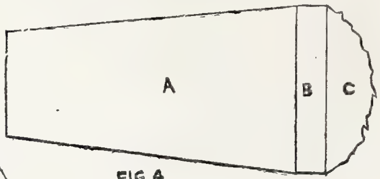


FIG. 4.

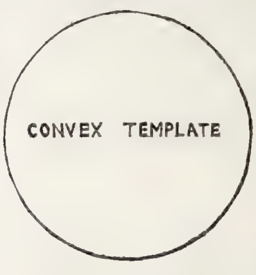


FIG. 3.

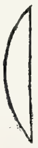


FIG. 1.

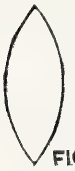
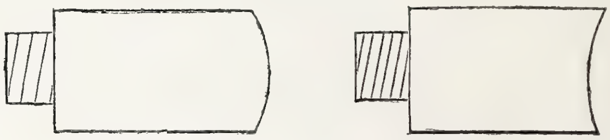


FIG. 2.



Having now the means of ascertaining the curvature required to form a lens of any required focal length, let us proceed to describe the construction of, say, a plano-convex lens of two inches focus and half-an-inch aperture (diameter). The radius of the curved surface in this case will be one inch (the focal length being twice the radius). Take a piece of thin sheet brass or sheet zinc, cut out a circle roughly rather over two inches diameter, set it up in the lathe, fixing it to the end of a woodchuck, and turn it down accurately to two inches diameter, being careful to remove all "burr" from the edge, leaving it as clear and thin as possible. Take a similar piece and turn out a hole from the centre, also exactly two inches diameter; remove it from the lathe and carefully cut it in half. You then will have a convex and concave pattern or template for gauging your grinding tools and work. These may be marked "one inch," and will be ready for use on any similar work having to be done at a future day. Next to form the grinding tools :—Take a piece of round brass, and turn a shoulder about a quarter of an inch from one end, and cut a screw on the end so turned down to fit any chuck you may have of convenient size; then cut off the piece so that it may be about one inch in length beyond the screw, and in the end of the piece so cut off proceed to turn a hollow, which must be tried from time to time with the circular template until the figure is accurately spherical. You will now have a concave grinding tool. Proceed similarly to form another with a convex end, which must be tried in like manner with the hollow template until the figure is accurate. If the work is desired to be very true it is best, in the next place, to take whichever of the tools appears to have the best figure, and placing it in the chuck put a drop of water on the concave or convex surface (whichever tool may be used); add a very little fine flour of emery, and, taking the other tool, proceed to grind one in the other, working that held in the hand up and down across the face of the revolving tool, keeping the surfaces in close contact, and changing the position of the tool in the hand every few strokes, that the work may be crossed in all directions. The requisite motion to give to the hand is not easy to describe, but far from difficult to acquire; the rest should be used as a support to the hands during this operation, but must be set so much below the work as not to interfere with the required motion. When the face of the tool held in the hand presents an uniform surface the tools should be reversed, that just held in the hand being placed in the lathe, and the grinding process repeated. Both tools, if the work has been accurately done, will now possess an uniform spherical surface, and will fit each other with the greatest nicety. They are now ready for use (see *fig.* 3). For the construction of the lens take a piece of good looking-glass plate free from scratches, and not more than about one-eighth of an inch thick, cut off a strip rather more than half an inch in width and cut it into squares; protect one surface by sticking on a piece of gummed paper, and with a pair of pincers "nibble" off the corners and bring as nearly to a circular figure as may be. When several discs of glass have been thus prepared make a holder by turning a piece of moderately-hard wood rather more than half an inch in diameter at one end and of any convenient thickness at the other, and an inch or so long, which will be found more convenient in practice than a greater length, though, of course, this is not very material. The end of half an inch diameter should be turned off square and flat (see *fig.* 4; A is the holder, B the guard glass, C lens roughed out on grindstone). Now, take two of the discs of glass, and, removing the protecting paper from the first, place a little of some strong cement on the flat end of the holder (tough sealing-wax answers fairly well); heat the disc of glass by placing it on a piece of tin, and holding it over a gas or other flame until quite hot, the side which had been protected uppermost. Bring the holder down upon it, adjusting it into position as it cools, and being careful that the cement "takes" everywhere. Now take another disc of glass, and with some old and tough Canada balsam cement it to the former, placing the protected side after removing the paper next the first glass, and put aside until firmly set; if properly done the two discs of glass will hold together as though in one piece. Now proceed with a common grindstone to give the two discs a more accurate circular form, and then, by holding the edge of the glass against the stone and turning the holder in the fingers, it will be easy to shape it roughly to the required figure. A very little time spent at the grindstone will save much after labour and prevent the figure of the grinding tools being injured. The next step will be the preparation of the emery, and as the success of the operation is dependent upon the care with which this is carried out, the directions given should be faithfully followed. Procure, say, half a pound of flour emery, and, placing it in a clean earthenware jar, add a very little water, and work it with a clean piece of flat stick into a paste, adding the water little by little, and being careful to see that no particles of dry emery are left either adhering to the stick or jar. Then have ready three or four wide-mouthed bottles (pickle bottles will do very well, washed quite clean). Take the largest, add more water to the emery paste, and pour the whole into this bottle, adding more water until the bottle is nearly full. If, notwithstanding the care before taken, any particles are seen floating on the top it is best to fill the bottle to overflowing, and so allow them to float off. Then stir the emery rapidly with the stick, and, allowing a few moments for the heaviest particles to settle, pour off the water and the lighter part of the emery into a bottle, No. 2. Some more water may be added to No. 1, and another stir given, allowing more time to settle, and the water and finer particles added to No. 2. Proceed in the like manner with No. 2, allowing about a minute before pouring off into No. 3. Continue the process, allowing five minutes, a quarter of an hour, and half an hour for settling in each case, and remembering to use a clean stick on every occasion. The residue of the water, after the interval of half an hour, may be poured off and left for the final settlement of the finest particles. The emery will now be sorted into various degrees of fineness, and should be carefully labelled "No. 1," "No. 2," &c., covers being placed over the bottles to exclude dust. This is a dirty and tedious process, but it is the only way to procure a supply of emery fit for the purpose, and a stock having been once prepared will last a long time.

We are now in a position to proceed with the grinding of the lens. Place the concave grinding tool in the lathe, place a little of the No. 1 emery on the face of the tool, add a drop of water, and begin to grind the lens in the same manner as directed for the grinding of the tools, adding more emery from time to time, and remembering to turn the work in the hand as before directed, that the surface may be crossed in all directions. The surface will soon be found to be "up," that is, a correct figure will have been obtained; when this point is reached the tool must be removed and washed *perfectly clean*, as also the work and the fingers of the operator. Continue the process, using a finer emery until a uniform grey surface appears; this should be examined with a magnifying glass to detect scratches. If the operator has been so fortunate as to escape these, he may go on after again washing the tool, &c., as before with some still finer emery; the surface will now be semi-transparent, with an approximate dull polish. The grinding process is now complete; the final polish has only to be given. Procure some jeweller's rouge, used by them for polishing silver, &c.; mix it with water to a paste as before directed for the emery, place it in a wide-mouthed bottle, and proceed to "wash" it as before directed. In this case, however, all that is required is to remove the coarsest part, which should be thrown away, all the remainder being kept for use in one vessel. Take the grinding tool, make it quite hot in any flame, place it quickly in the lathe and hold a piece of clean pitch to it as it revolves, which will leave a coating on the face of the tool. Take the convex grinding tool, place a drop of water on the face of it, and while the pitch is still warm work the convex tool on it as in the process of grinding, which will give the surface of pitch a true figure. Let it now get cold, and, adding a little rouge with a drop of water, proceed to polish the lens, using rather more speed than in grinding, the motion of the hand, &c., being in every respect as before. The polish will begin to appear at once, and should be clear and brilliant. I have supposed the operator to proceed from beginning to end of the process without a check; in practice, unfortunately, things do not always go so smoothly. A deep scratch will suddenly appear at times as the work is nearly complete, requiring the grinding to be done *de novo.* The lens will often come off the holder, and other mishaps, for which there is no remedy but work and patience, will happen. The learner must console himself with the thought that there is no royal road to this or to any other acquirement. I have smoothed the path as far as I can, but skill and experience each operator must acquire for himself.

The task being now happily completed, the use of the guard glass will be apparent. Warm the lens carefully and remove it from the wooden holder; and if the lens and guard will not part on being warmed place both in an iron spoon with some spirits of turpentine, and boil it for a moment, when they will readily separate, the edge of the lens being as clear and sharp as a knife—a result which cannot be obtained when the lens is ground without the use of the guard.

In grinding double-convex lenses one surface should be ground and polished first; a guard should then be formed by grinding out a hollow in a suitable piece of glass with the convex tool, to which the finished side should be cemented. The work of grinding and polishing the second surface can then be proceeded with, and the lens finished to an edge. This should always be done far accurate work, as it ensures the correct centering of the opposite surfaces.

I have supposed the plano-convex lens to be formed of plate glass, and have consequently given no directions for grinding and polishing plane surfaces. A good piece of English plate has a much better surface than anything a beginner would be likely to produce. When he has mastered spherical surfaces he may then try his hand.

Concave lenses are ground, of course, on a convex tool, the process being similar to that before described. The work is more difficult, as the opposite surfaces are not so easily centered. I have treated on this subject at length, at the risk of wearying your readers, as I believe no directions for this kind of work have ever appeared in print before, and it certainly is not an art attempted by many amateurs.

Design and Work has our best wishes for its continued efficiency. It appears to have a large circle of readers, which we hope will still increase.

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THE DUBLIN UNIVERSITY MAGAZINE. July, 1877.

London: HURST AND BLACKETT.

To photographers the chief attraction of the *Dublin* for the present month will be found in an admirable cabinet portrait of Dr. Samuel Birch, the learned and talented Keeper of Oriental, Mediæval, and British Antiquities in the British Museum, which has been photographed in the best style of Messrs. Lock and Whitfield, and charmingly printed by the Woodbury process. The photograph forms the forty-second of the series begun in 1874. It is accompanied by a memoir and critical notice of the labours of Dr. Birch. An article on *The Supernatural* will possess much interest for many who are engaged in solving some of the knotty problems which at the present day are constantly presenting themselves; and Lady Wilde's article on *The Fairy Mythology of Ireland* will not fail to charm more than those connected by ties of country with the Green Isle.

◆

Correspondence.

◆

PHOTOGRAPHING ON ENCAUSTIC TILES.

To the EDITORS.

GENTLEMEN,—Can you tell me if any instructions have appeared for printing from negatives, or transferring transpariences, on to encaustic tiles? I have thought of decorating some white tiles in this manner, but cannot find any method of doing it described in the photographic literature I possess.

It is quite the fashion for ladies to paint on tiles now, and most of the leading china merchants, such as Messrs. Mortlock & Co., make a regular business of burning-in amateurs' paintings; so I have no doubt I could get photographs burnt-in in the same way if I only knew, in the first place, how to get the picture on the tile.—I am, yours, &c.

Bowscar, Penrith, July 23, 1877. A. W. E.

[So far as regards the mere transferring of a transparency from the glass plate upon which it is produced to an encaustic tile, it is effected by placing the transparency in an acidulous liquid—such as diluted sulphuric acid, or a strong solution of citric acid—until the film is seen to rise from the glass and float in the liquid. It may be necessary to aid this by running a sharp knife round the margin so as to cut through the collodion film. The tile having been placed in a flat vessel of water, the detached film is lifted from the acidulated water and carefully floated into position upon the tile, which must now be raised from the water in such a manner as not to disturb the film. But, for burning-in, the transparency must undergo toning in a bath of iridium, platinum, gold, or other metallic salt which will yield a pleasing colour to the picture after it has been burnt-in.—EDS.]

◆

THE PRODUCTION OF PHOTO-ENAMELS.

To the EDITORS.

GENTLEMEN,—In reference to the few remarks of your contributor, Dr. John Nicol (in his *Notes from the North* in your last issue), as regards the ease with which photo-enamels may be made, I, for one—and I have no doubt there are many others who would be pleased to receive the information—would like to know what are the suitable arrangements by which the transparencies in the process can be thoroughly toned as quickly, or nearly so, as paper prints. Leaving all the rest to the dexterity of the operator, I find it takes from eight to twelve hours to tone a thin transparency.

Further information on the above subject will be esteemed by—Yours, &c., R. C.

Liverpool, July 23, 1877.

[Perhaps Dr. Nicol will supply the desired information.—EDS.]

◆

CARBON PRINTING.

To the EDITORS.

GENTLEMEN,—In my letter of the 16th inst., I stated that I could find no existing patent at the Patent Office claiming any special method of preparing paper for transferring. This is perfectly true, but I have found an old and lapsed patent of Johannes de Witt Brinckerhoff (No. 2648, October 13, 1865) for *Preparing Paper and the Surface of other Materials Used in Photography*, describing an article which, though not specifically claimed as a transfer paper for carbon printing, would answer remarkably well for the purpose. As this, as well as the patent I referred to in my last, has "lapsed," Messrs. Marion & Co. or Messrs. "Anybodyelse" may prepare it for sale.—I am, yours, &c.,

July 24, 1877. CABONIENSIS.

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Miscellaneous.

PHOTOGRAPHY IN COURT.—THE WAYSIDE ARTIST AND THE OSTLER.—At Edmonton, on Monday, the 16th inst., William Smith, ostler at the Queen's Head, Green-lanes, Hornsey, was charged with assaulting C. H. Richards, of 1, Millfield Place, Green-lanes, photographer.—Complainant stated that on the previous Friday he was sitting on his box by the side of his photographic apparatus outside the Queen's Head (where he had carried on his business for some years), when a hansom cab drove up containing a lady, gentleman, and child. He was asked to photograph them, and did so, and they paid him. After they had gone, defendant came up to him and said, "You ——; you have done me out of my money again." Witness replied that if he (defendant) had lost the watering of the horse through him, he would pay the twopence which was usually given. Defendant, however, exclaimed, "You——; I have threatened to murder you before," and knocked him down as a butcher would a bullock. He had received the permission of Mr. Gill, the landlord of the Queen's Head, to stand where he did, and also to take portraits in the garden.—Defendant said that was not true. Permission had never been given.—Edward Viney said he was complainant's partner. He saw defendant knock complainant down.—Defendant said he had been at the Queen's Head many years and paid rent; complainant did not, and interfered with his business.—Mr. Nash: In what manner?—Defendant said horses had hay and water, and through complainant introducing his photographic business they often went away without paying. On the present occasion the cab horse was not paid for, and when complainant offered to pay he (defendant) said "I'll pay you," and did strike him. He had been a nuisance for a long time.—The Bench told defendant he had no right to take the law into his own hands, and ordered him to pay 40s. and costs, or go to prison for fourteen days. The money was at once paid.

EXCHANGE COLUMN.

Steinheil's No. 4 aplanatic doublet in exchange for a Dallmeyer's No. 2 wide-angle rectilinear lens for plates 15 × 12. Difference in cash.—Address, Joseph Brookes, Brade's Village, Oldbury, near Birmingham.

In exchange for pocket quarter camera with three double backs will be given a sliding-body stereo. camera, rising front, two sliding-body quarter cameras—one with two single backs, the other square—and with French portrait lens.—Address, A. W. Beer, Trinity House, Leeds.

ANSWERS TO CORRESPONDENTS.

Photograph Registered—

Robert Banks, Manchester.—*Photograph of Elizabeth Dennison, of Hulme, Manchester.*

☞ *Correspondents should never write on both sides of the paper.*

Notice.—Each correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a *nom de plume* as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

J. Johnston.—Thanks. In our next.

Doubt.—Full particulars respecting the exhibition will be found in another page.

J. E. G.—We are making inquiries. Of the result you will be apprised by private letter.

R. B. Ward.—Not having critically examined Voigtländer's new lens we are unable to reply to your questions.

Geo. G. Smith.—1. Paint the background in distemper.—2. We cannot give more detailed directions than those which have been published.

Oxon.—Acting upon your suggestion we called and saw the picture, but were not impressed with the so-called stereoscopic effect of the figure of the lady.

Tycho.—We have examined the specification, and have no hesitation in saying that it is identical, in all essential points, with that which we published in 1871.

S. M'George.—If a specimen print be forwarded for examination we shall then be able to understand better the nature of the defect, which you describe in a rather imperfect manner.

Received.—The *Turner's Manual*, Nos. 1 and 2. This manual is a translation of the valuable work by L. E. Bergeron. It is edited by Mr. D. A. Aird, and includes several useful illustrations.

L. C. (Leith).—The glass corners described would answer very well, but not better in any respect than plain slips of glass fastened in with cement. Yours, however, will of necessity be somewhat expensive.

A. J. Graham (New York).—The Almanac for 1870 contained only a few paragraphs on the production of "relief lines;" but in a subsequent Almanac—that for 1876—the subject is treated much more fully.

Micros.—We have seen in the *English Mechanic* the strictures to which you allude, but do not feel called upon to offer any opinion whatever concerning the merits of microscopic objectives, by whomsoever made, and whether patented or otherwise.

J. Thompson.—The "reflecting stereoscope" which you describe possesses no claim whatever to the name. It is a common *refracting* stereoscope with a mirror for reflecting the light upon the picture. A proper reflecting stereoscope is an instrument of an entirely different character.

George White.—The cause of the tint in the margin of the picture is due to the tissue having been exposed to light in your operating-room. Always bear in mind that carbon tissue is more sensitive than excited albumenised paper, and, as we recently showed, the action when once started continues to go on.

Rev. A. Glover.—Select a bath of German glass in preference to the heavy green glass ones made in this country. Of course you must have it lined with wood. But have you ever considered the propriety of using a bath constructed altogether of wood the inside of which is coated with paraffine and wax?

H. R. H. (Aberdeen) writes:—"While working up autotypes in black and white I have been much perplexed with greasiness on the surface of the tissue. I have tried the different methods in water colour painting, such as ox-gall and washing, but I find them of little use. If any artistic correspondent would be kind enough to help me out of my difficulty it would greatly oblige."

An Intending Tourist.—Confine your chemical outfit to a bottle of washed emulsion and dropping-bottles for containing concentrated developing solutions, together with the materials for making these and the fixing solutions. Provide a few dozen sheets of gelatinised paper, and make a habit of removing every negative film from the glass after it has been developed. The negatives thus attached to paper may be easily stored away, leaving the glass plates free to be again coated.

G. V. H.—The cost of the degree "Ph.D." (doctor of philosophy) varies from £15 to £20. If you choose to purchase this degree from one of the American Universities—for whom some one in this country, or in Jersey, acts as agent—you will obtain it without the *slightest* difficulty. The price of the degree "M.A." from the same university is £5; but we need scarcely say that such *purchased* degrees are held in contempt by all scientific men, who prefer to earn their laurels before wearing them.

Gilbert R——.—There will be no necessity for providing side lights to the proposed studio if you adhere literally to the plan enclosed. If a line be drawn from the eaves to the place where it is intended to place the sitter it may be seen that there will be quite enough of side light.

P. M'Leod.—Although it is always better to print to such a depth as will ensure a fine proof after toning and fixing, yet, when such lapses as those you describe do occur, it is best to wash the print thoroughly upon removal from the printing-frame and immerse it in a nearly saturated solution of hyposulphite of soda, keeping it there until it has been reduced to a sufficient extent. Now wash thoroughly and transfer to the toning-bath. It may tone rather slowly, but it will eventually become of a good colour.

Thomas (Hulme).—Our correspondent possesses a "rapid" lens constructed to cover a whole plate. He has read our article in last volume *On the Extemporising of Wide-Angle Lenses* (page 206), in which, it will be remembered, we advocate the use of a supplementary short mount as an expedient for bringing the lenses closer together, thus enabling the objective to cover a plate of larger dimensions than the maker intended when used under its best condition. Having obtained this supplementary mount, our correspondent finds that no more subject is included in the whole plate by its agency than when the original mount is used. But it is impossible that this should be otherwise, inasmuch as the focus of the lens remains the same as before, with the exception of the trivial alteration caused by shortening the tube. Now, as width of angle depends upon the relation between the focus of the lens and the size of plate to be covered, it follows, of course, that any alteration made upon the lens by which the focus is left unaltered will only destroy its efficiency without increasing the angle of view, provided always that operations are conducted upon a given size of plate. "What, then," a tyro may inquire, "is secured by the suggested alteration?" Simply this—the lens will give a much larger field of delineation than it did previously, and, owing to this more extended field, it will cover a plate of far greater dimensions than before. When used in the latter capacity it is a "wide-angle lens." In the article alluded to we have described by what means we obtained 10 × 8 negatives quite free from distortion by means of a 5 × 4 rapid rectilinear lens. This lens only enacts the *rôle* of a wide-angle objective when employed in taking the larger-sized picture. Assuming our correspondent to be a representative man, we have gone into this matter at present with the greatest possible fulness; and, with the aid of the explanations now given, we request our correspondent to again read the article to which reference has been made.

M. A. (Bristol) possesses a portrait combination about which there is something that at first sight appears inexplicable. He says:—"Kindly inform me how to clean lenses at present in the following condition:—Nothing visible on looking through, but at an angle of from ten to twenty degrees the lenses appear like a soap-bubble just about to burst. It is not the fault of the cement, nor is the back lens of the back set in any way affected. I have tried glacial acetic acid and spirit, but with no result. The lens is a capital instrument, and I think would be more rapid if cleaned."——The irridescent appearance is probably caused by the state of the balsam by which the two elements of the front lens are cemented. The remedy consists in having the lens removed from its cell, placing it in water just sufficiently warm to melt the balsam, thoroughly cleaning (by ether or benzole) the two contact surfaces, and then re-cementing with fresh balsam. But we advise that the lens be left in its present condition until our correspondent has an opportunity of showing it to a practical optician.

Received.—Murray Russell; "A Dominie," &c. In our next.

LONDON GAZETTE, *Friday, July* 20, 1877.

Partnership Dissolved.

B. J. Edwards and Co., Fleet-street, and Lincoln-terrace, Kilburn, photographic printers.

METEOROLOGICAL REPORT.

Observations taken at 406, Strand, by J. H. Steward, Optician.

For two Weeks ending July 25, 1877.

These Observations are Taken at 8.30 a.m.

July.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks
12	30·03	E	56	63	77	56	Dull
13	29·79	W	58	65	77	55	Dull
14	29·61	SW	61	64	68	61	Cloudy
16	29·37	SW	57	61	62	55	Dull
17	29·47	W	57	60	64	55	Dull
18	29·86	W	55	61	—	53	Cloudy
19	29·85	SW	58	63	71	57	Cloudy
20	29·92	NW	51	60	70	56	Cloudy
21	30·03	W	55	61	73	50	Fine
23	29·67	SW	61	65	70	60	Dull
24	29·58	W	57	62	73	56	Cloudy
25	29·92	NW	57	64	—	53	Fine

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 900. Vol. XXIV.—AUGUST 3, 1877.

SINGLE TRANSFER.

In Three Chapters.—Chapter II.

Although we consider the method which we have described of obtaining reversed negatives to possess exceptional advantages, there is another which, although a little more costly, will produce equally good results without entailing any necessity for making the slightest alteration upon the dark slide. It consists in having adapted to the lens a supplementary cap containing a small reflector, which may be either a piece of silvered glass or a rectangular prism. The most approved methods of making silvered mirrors and prisms having been described in our Almanacs and previous volumes of The British Journal of Photography, it is not considered necessary to revert here to their construction; we shall, therefore, assume their existence.

If this reflecting cap be placed upon the lens, and the side of the camera turned towards the sitter or other object to be photographed, the image will be reversed in its position when compared with a negative of the same image taken by the unassisted lens in the usual manner. With regard to the respective merits of the two reflectors, the mirror and the prism, advocates are found who attribute special features of excellence to each in preference to the other. We give, as the result of our own experience in this direction, the following:—If a prism be of unexceptionable excellence it appears to be slightly, but only slightly, better than a silvered glass reflector; but if the prism be only of medium quality, as respects a want of homogeneity in the glass and of flatness of any of the surfaces, it is then much worse than a silvered glass mirror of even second-rate excellence. So difficult is it to obtain a large glass prism of good quality, unless a great expense be incurred, that we recommend those to whom a reasonable economy is a matter of consequence to discard altogether the idea of a prism, and to employ a mirror instead. We are now referring to solid glass prisms, and wish this distinction to be borne in mind, because, as we have long since said in an article specially devoted to prisms, it is possible to build one out of a few plates of glass which, when filled with fluid, will be free from those defects so commonly to be met with in glass prisms.

We need scarcely remark that ordinary mirror glass will not answer for a reflector of the kind required in photography, because the silvering is on the back of the glass. To ensure perfect reflection the silver must be deposited on the surface, and then polished by means of a piece of soft wash-leather charged with rouge. If a flat piece of glass be selected for this purpose the image obtained by the mirror will be quite as perfect in every detail as if the unassisted lens were alone employed. The time of exposure must be slightly, but only very slightly, increased. The mirror must be mounted at an angle of forty-five degrees to the axis of the lens.

What has hitherto been said has been on the assumption that negatives are to be taken for the express purpose of carbon printing in single transfer. But when we consider the hundreds of thousands of negatives that already exist, and which have not been taken with this intention, it is evident that in an article on single transfer the utilisation of these must have an important place assigned to it.

There are three methods by which existing negatives may be rendered useful for this kind of carbon printing—two of them by reproduction, and the third by transference.

An excellent method by which a negative is reproduced in a reverse position by a single operation consists in coating a plate with *bromised* collodion or emulsion. Any process may be employed so long as the sensitive film consists only of bromide of silver. This plate is exposed, by the superposition method, under a negative for twenty or thirty seconds to the flame of a gaslight, and is developed by the alkaline pyrogallic developer. When the image is fully developed—at which stage it is a positive or transparency—it is washed, and a little nitric acid is applied to the surface, by which it is converted into a feeble negative by the dissolving away of the metallic silver forming the image; but after rinsing the surface, and again applying the same developer as before—this time in the light—a reversed negative of great vigour rewards the skill of the operator.

Another method consists in coating a plate of glass with a little of the sensitive fluid made use of in what are termed "dusting-on processes." We need not here occupy space by reproducing the formulæ, inasmuch as all the best preparations for this mixture have been given *in extenso* in the pages devoted to formulæ in the last and previous Almanacs issued in connection with this Journal. A plate having been coated and dried is exposed to light under the negative for a brief period, and, having been removed to a room in which the atmosphere is rather damp, it is dusted over with finely-powdered plumbago, a large and soft camel's-hair brush being employed for this purpose. After a few seconds it will be found that a reversed negative gradually becomes developed under the action of the brush, which action is continued until every detail is brought out in a brilliant manner. Prints obtained from negatives produced in this way have been publicly exhibited in London side by side with some from the originals, with this result—that it was quite impossible to discover even the very slightest falling off as regards either sharpness or detail.

It is probable that the process now to be indicated for transferring films will be preferred by photographers to those previously described. We believe this will be the case for the following reasons:—The operation of transferring can now be conducted with so much success that not a single negative will be damaged; and, further, a negative in the pellicular form can be employed in the production of prints by any process, as either one side or the other may be placed in contact with the sensitised surface.

The negative, having been placed on a levelling-stand, is coated with a solution of india-rubber in benzole, its consistency being about that of thin varnish. When this is dry—which will be the case in a few minutes—pour over the surface a considerable quantity of a thick collodion, consisting of an ounce each of cotton and castor oil dissolved in two pints of methylated alcohol and one pint of ether. Care must now be taken that the plate be not disturbed until the film sets and becomes hardened, after which it may be removed from the levelling-stand and reared up till *quite* dry, which may take about twelve hours. The margin is now cut through with a sharp knife so as to ensure the film being separated, after which it is placed in a vessel containing water and allowed to remain there until the combined films leave the glass. The pellicular negative is then dried between sheets of blotting-paper, after which it is ready for use.

Should the negative have been varnished, as will most probably be the case, the varnish must be removed before commencing the operations just described. This is done by pouring over it, two or three times, a mixture of one part each of alcohol and caustic potash with ten parts of water. This speedily effects the removal of the varnish, after which the negative is washed, dried, and treated as already indicated.

Having now described several methods by which reversed negatives may be obtained, we shall next proceed to show in what manner they are to be used in the production of carbon pictures.

ON METALLIC CHLORIDES AND BROMIDES IN EMULSIONS.

Since writing on this subject last week we have completed a series of experiments instituted with a view to test the correctness of the idea we had formed as to the chemical *rationale* of the behaviour of the metallic haloids in removing fog from emulsions which had become useless from that cause. The change brought about appeared to us, as we have said in the article to which we have referred, to consist of something more than the mere neutralisation of any excess of silver which might be the cause of the fog, and to differ in at least one respect —the rapidity with which the change is effected—from the somewhat similar, but more gradual, clearing which frequently ensues from the addition of an alkaline chloride or bromide. The effect we imagined to depend upon the specific action of those metallic salts in re-changing to the haloid state any portions of the sensitive silver compound which might have been wholly or partially reduced either by the action of light or by actual decomposition in the emulsion itself—an action equivalent to the destruction of the latent image.

We need not enter at length into the reasons which induced us to adopt this view; it will be sufficient to direct our readers' attention to the different results ensuing from the application to an exposed but undeveloped film, or to the developed image of solutions of an alkaline and a metallic haloid respectively. In the case of an undeveloped film treated with alkaline chloride, bromide or iodide, if thoroughly washed, so as to remove as far as possible all trace of the salt, an image may be subsequently developed, whereas a metallic haloid removes the image entirely. If a developed image be similarly treated the alkaline salts produce no change, but the salts of many of the metals—notably gold, platinum, copper, mercury, &c. —attack the silver image, reducing it to the haloid state with the simultaneous formation of a sub-salt of the secondary metal. The salts of cobalt, nickel, and zinc, with probably others, appear to occupy an intermediate position, exercising a powerfully-destructive action upon the latent image, but no bleaching effect upon the developed picture.

We last week mentioned Mr. M. Carey Lea as having insisted upon the use of a *metallic* chloride for clearing foggy emulsions; but it had slipped our memory at the time that another experimentalist had specially recommended the gold salt. Thus it would appear that both recognised the distinct action of the metallic chloride, but attributed it to the action of the halogen. We now offer a rational explanation of the phenomena, and shall attempt to show that the action occurs indiscriminately whether a chloride, bromide, or iodide be employed, provided only the halogen be in combination with a metal for which it has *a less affinity than for silver.*

Our first experiment consisted in preparing an emulsion with an excess of silver to the extent of about three grains per ounce, and without any restraining acid. This was allowed to "ripen" thoroughly and to pass into the stage of hopeless fog, which occupied about four days. In this state the emulsion was incapable of producing an image, however poor, owing to the rapidity with which it fogged under the action of the developer. It was now divided into four portions, which were treated respectively with the chlorides of ammonium and copper and the corresponding bromides, sufficient of each salt being added to leave as nearly as possibly one grain per ounce in excess of the quantity required to exactly neutralise the free silver. After allowing the separate emulsions to rest for twenty-four hours they were tested, with the following results.

The first one, corrected with chloride of ammonium, was found to be practically unimproved, as, although it behaved differently as regards the colour and density of the fog, the latter completely overpowered any image which might be developed. Number two, with which cupric chloride was used, produced a distinct image, but very weak and metallic-looking; its fogging propensities, however, were so great as to preclude all possibility of securing anything like printing density. The next sample, corrected with ammonium bromide, occupied a position midway between the two previously mentioned, and was practically useless. The last produced the most satisfactory result, but gave evidence of insufficiency of time for the bromide of copper to exert its full action. The early stage of development proceeded well enough; but as it progressed a general veil crept over the plate and prevented the acquirement of full density. After the lapse of another twenty-four hours the emulsions were again tested, but, except in the case of number four, the results were not materially altered. Numbers two and three were slightly improved; but number one remained as bad as ever. Number four, however, now worked as bright and clean as could be wished, and showed a fair amount of sensitiveness, dependent, of course, upon the thoroughness of the washing to remove the soluble bromide.

In explanation of the unfavourable character of the result obtained with chloride of copper we may call attention to the fact of the emulsion containing a very large proportion of silver chloride and *no acid.* Chloride of silver appears to require the presence of restraining acid in order to prevent its too easy reduction by the developer, and this, no doubt, will account for the unfavourable result recorded above. Should time not bring about a further improvement we shall try the effect of an addition of acid.

By way of further experiment we exposed a washed emulsion for several hours to full sunshine, until after thorough shaking it showed visible signs of discolouration. It was then found, as might be expected, to be in a hopelessly unworkable state, and was divided into four parts and treated in the same manner as the other, using an excess of two grains of soluble haloid to each ounce. In consequence of the severity of the treatment none of the four samples were capable of giving a satisfactory result after either twenty-four or forty-eight hours' rest; but after three days the two treated with copper salts showed signs of clearing. After four days they were workable, and exhibited this notable difference—that while the sample treated with bromide worked the cleanest, that in which chloride had been the active agent was the more rapid and gave the softer picture. The remaining two are still hopelessly unworkable, though, possibly, time may bring about a change.

In these experiments we selected the copper salts as the representative ones, on account of their easy solubility and because they have been already employed in emulsion work. The bromide of copper used was prepared by decomposing the sulphate with bromide of potassium, and, after filtration, evaporating the solution to a small bulk and collecting the impure crystals. These were then treated with warm, strong alcohol, to dissolve the copper salt, leaving the sulphate of potash behind. The resulting bromide of copper, though not quite pure, is sufficiently so when great exactitude in the combining proportions is not required.

In conclusion: we think that the "regenerative action" of chlorides upon foggy emulsions, as claimed by Mr. Lea and others, is not attributable to the chlorine, but to the use of a salt capable of restoring partially-reduced bromide of silver to the haloid state. To effect this it is necessary to employ a haloid of a metal whose affinity is less than that of silver, and the result is practically equivalent to the addition of a free halogen to the emulsion. Of the complications introduced by the presence of sub-haloid of the secondary metal we are not at present prepared to speak.

STUDIO ROUTINE.—PRINTER'S ROOM.

Photography, as a profession, is of such recent growth and has seen such continual change that there has not been time for traditions of business detail to grow about it; and that system, without which no business or profession can expect to prosper, has not run into such regular grooves as to have permitted its unwritten laws to be handed down from master to apprentice in that thorough fashion which has helped to make the fame of English men of business as world-wide as it is. Artistic skill alone, even the highest—and without it no one has a *raison d être* in the ranks of the photographic profession—is, when competition steps in, of no avail against a combination of business training and knowledge with good photographic attainments. Indeed we should not be very far from the truth if we stated that business skill was the only requirement, when we bear in mind the establishments which are doing large amounts of business solely on the strength of a name the owner of which for years has never touched a negative, and those in which the active principal is not a practical photographer at all.

Again: it happens, too, or has done to a comparatively recent date, that many have entered upon a photographic career simply from a love for the art, without having had previous business training, or previous experience with other photographers. To these and others, if we may judge from difficulties we have seen and the queries we have had put to us, a few hints from time to time upon business arrangements and details will be acceptable and useful.

We shall describe plans adopted at some studios—not entirely as models to be copied, but rather as examples of what is done, upon which every one may either found or improve his own system.

As one, and a very important, point in the management of a business is the rapid and punctual sending out of pictures ordered, we propose to describe an excellent method adopted by one photographer in giving out the work, as it may be termed, for the printers. His former method—one commonly employed—was simply to book orders as he received them, and send a copy up to the printers every morning; but he found that in the busier times the printing, or at anyrate the despatching, of the pictures was always accompanied with more delay than he thought necessary, and when inquiries were made it was most difficult to find who was to blame. The printer blamed the sorter, the sorter blamed the mounter, the mounter the spotter, and so on to a most unsatisfactory extent. After devising first one plan and then another, he hit upon the one we are about to describe, which appears to us to be a very happy and systematic method, and he tells us that it answers perfectly. It is at first disliked by new hands; but once mastered it works excellently, and he tells us that orders are executed in half the usual time.

Orders received during the day are booked in the ordinary manner, and the printer receives his orders by means of slips, each order being written on a separate slip, though it be for but a single *carte*, and it is the rule that no instructions whatever for printing are given to the printer except upon these slips. By this simple means all chance of misconception are avoided between the reception-room and the printing-room—formerly a fruitful source of annoyance and delay. We print an exact copy of one of the slips in question, which are kept in books of a hundred leaves, each leaf containing nine slips, separated from each other by rows of perforations, any slip being thus easily detachable from the rest. Each perforated printed leaf is alternated with one quite plain, which receives a copy of each slip as it is written in pencil by means of the interposition of a piece of the usual black transfer paper:—

Date ....
Printed ....
Mounted ....
Spotted ....
Register No. ....
Name ....
Number and Style ....

The slip is almost self-explanatory, but we will try to make it clear to every one. It is sent up to the printers' room filled in with the name of the sitter, date of order, the register number of the negative, the number required, and the style, whether vignette or otherwise. When the slips are received by the head printer the negatives are found and placed in frames, and with each negative is placed in the frame its own slip. In place of keeping count upon the frame or negative itself, as is commonly done, the slips themselves at their lower end have a space left for the purpose upon which a tick or stroke is made for each print done, and then the strokes are crossed when necessary to represent two.

When the required number is done the printer marks his slip with the date and sends it down to the reception-room, where the prints are carefully sorted, and if too many are rejected the slip is returned with a memorandum to that effect. If right they are passed on to the mounter, who, when the day's mounting is dry, sorts the *cartes*, attaches to the face of each batch by means of an elastic band its own slip, fills in the space for date of mounting, and sends them up to the spotter, who, when his work is done, dates the slips in the required space, and each day brings them before the principal. He examines every picture before allowing them to be sent out, and so keeps up the tone of his work, while, with the slips before him, he can see at a glance how long an order has been in execution. If the various dates in the slips do not follow in proper sequence he can tell in a moment if there be a stoppage is any department.

When the slips have passed through all hands they are pasted into the book in the place they originally occupied upon the top of the counterfoil or duplicate sheet. A double purpose is thus served—if any order happen to be neglected it is quickly discovered by a periodical inspection of the slip book. Looking back beyond (say) two or three weeks' pages it is seen in a moment if a slip be not returned to its place, and inquiries can at once be instituted to ascertain the cause. The other useful purpose the slips serve is in case any dispute arise with a client as to whether any of a certain picture were sent or not, or as to the exact number sent. A book to show deliveries, and the slip book to show the work done, afford proof sufficiently convincing for either a private person or a court of law.

In conclusion: we may say that, whether the plan of these slips be adopted or not, we cannot too strongly commend for imitation the plan of the principal examining every picture before allowing it to leave his studio.

We have recently had occasion to make use of the plumbago or "dusting-on" process for modifying the printing qualities of negatives, and have found the means so simple, and at the same time so effective, that we think it is a pity photographers generally do not avail themselves of the process to a greater extent. Independently altogether of the use of the "dusting-on" method for the purposes of reproduction, it may be almost classed as a true intensifier, as by its means the density of a thin negative may be augmented to any desired extent without running the slightest risk of spoiling it, and with the advantage over the usual plans that it gives extraordinary power of *local* application, enabling the operator to produce certain effects in a portion of the negative without interfering with the character of the remainder. The unwillingness of photographers to adopt this process arises, no doubt, from a fear of the difficulties to be encountered; but really those difficulties are infinitely less than are surmounted daily in other branches of the art, the chief one being to secure freedom from dust and specks in the solutions. In the matter of exposure but little trouble need be experienced, as a considerable amount of latitude is permissible, and great alterations may be made in the character of the image during the development. In adopting this method merely for the "improvement of negatives" the secondary image may be formed upon either side of the plate, and in the majority of cases it will be the safer plan to use the reverse side, as there will then be no chance of injuring the negative during the various operations necessary. Amateurs who are not in frequent need of this class of work will find it convenient to keep the hygroscopic mixture ready for use, but unsensitised, as when the bichromate is added the mixture soon becomes useless, especially in warm weather. The formula we are at present using consists of—grape sugar and dextrine each one ounce, water ten ounces. Dissolve, and allow the sediment to settle; then filter carefully. When required for use pour out a sufficient quantity, add an equal bulk of a forty-eight-grain solution of bichromate of ammonia, and again filter. During the hot weather many will find a drop or two per ounce of glycerine an advantage in hastening the development; but we prefer the slower development, as being more satisfactory. Bichromate of potash gives a film with greater hygroscopic tendencies, and in very hot weather may be preferred to the ammonia salt; but for several purposes the latter is, we think, the best. A saturated solution of bichromate of potash may be substituted for the bichromate solution given above. Ordinary powdered blacklead of the oil-shops, roughly sifted, will develope well. We have obtained very good results with common lampblack obtained from the same source.

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PHYSICAL PECULIARITIES OF EMULSIONS.—ACTION OF CARBONATE OF AMMONIA ON SILVER PRINTS.

It may interest some of your readers, who are, perhaps, silently trying the process, to hear that Captain Abney's "albumen emulsion process" has not yet succeeded in my hands—at least as I understand it should do.

I have tried Captain Abney's last formula, but do not find it give more sensitive plates than those I have before prepared by the previously-published process. I have, however, obtained plenty of "thinness of image;" but then this is the characteristic of another emulsion, prepared with rectified alcohol (as, also, was that by the last formula). I am not prepared to say whether methylated spirit is the cause of density, because I added glycerine to the former emulsions before pouring out to set; this was omitted in the last two "rectified" emulsions. Glycerine is not always pure (though mine is the "best"), and therefore not a neutral substance. I think it will be found that at least some samples of methylated spirit give density, without detracting, probably, from the sensitiveness.

There is a marked change of colour by transmitted light in these "rectified" samples. I am not able to say how far this colour resembles that of Captain Abney's productions, but the change is, certainly, in the direction indicated by him.

And here is a point of which I wish all who may be trying the process to make an especial note. Let them examine the different samples they produce, and, if they are found to vary in character, let them allow the bottles containing them to stand for (say) twenty-four hours. If they now gently shake each bottle in turn, so that a little emulsion is dashed from *the surface* against the sides of the bottle, they will, I think, not fail to notice the *reddest* effect their emulsions are capable of showing. If, again, the bottles are then well shaken, they will find that the emulsions have the effect of whitening, or "cooling," the colour transmitted through yellow glass. Of course care must be taken in exposing to the paler shades of orange glass, unless the emulsions are to be laid aside for a day or so. If preferred, a little of the "top" of the emulsion may be poured carefully on a plate, and then, after shaking the bottle, another little patch may be placed alongside, and the difference noted by white light.

Now, if the effect is as I have described it, what should we be justified in thinking? It seems to me that we have evidence that the finest silver bromide in the emulsion transmits, mostly, the red rays; and, again, that the coarsest bromide in the emulsion transmits the rays at the more refrangible end of the spectrum. In support of my belief I can state that the greener emulsions deposit their silver to a great extent long before the redder emulsions do so. A correspondent—an old amateur—writes to me that the most sensitive emulsion he has made by this process was "rather granular." And then, again, why should the rapid emulsions give thin images? I say, because the silver bromide is in a coarser state. My red emulsions give dense images because the deposit is finer.

I am not sure that I am right in the proposition I am about to make, but here it is:—It is not unlikely that the transparency of a bromide plate—presuming an equal quantity of bromide in both cases—shows fineness of division of the silver bromide, opacity denoting an opposite state of things.

An emulsion kept under silver nitrate for a prolonged time becomes more opaque and at the same time more granular, and, I may add, more sensitive. Again: it will be found a rather difficult matter to magnify the particles of silver bromide in some of the clear red films I have produced with gelatine into visibility. I do not mean here to convey the idea that I suppose there is an undeviating and "hard and fast" rule as to the causes of appearances of emulsions. I have now in mind a fact which is rather against my theory. I refer to Mr. Warnerke's experience as stated at the end of his article in your last ALMANAC, page 101. Here opacity (coarseness?) is associated with density of image, and (this in my favour) redness with density of image.

By-the-bye, in connection with Mr. Warnerke's experience, it has struck me that the change in some zinc gelatine emulsions, which I mentioned in a letter published in this Journal, may have been caused by some accidental and unknown exposure to actinic light, as the result was like that produced by Mr. Warnerke, though I do not think there was any additional density. There was plenty of that before the change. Here, perhaps, we have a more opaque (coarser?) bromide more sensitive than a more transparent sort. The chief difficulty in this theorising is that the emulsions became redder, instead of greener, as they should have done according to my theory. At anyrate the fact remains that we find the more opaque emulsion the more sensitive. What is the cause of opacity?

I believe Kennett's pellicle is as sensitive as any gelatine prepared by me, and often more so; and yet granularity is its principal fault—*as a gelatine emulsion.* Of course with care the granularity of the emulsion may be filtered out to a great extent, if not entirely; but I refer to the emulsion as a whole. There is a tendency to granularity.

I have two or three small negatives of cattle, which I have taken during experiments, and of which I thought I might "make something" by enlarging; but though the deposit is fine enough to print, an enlargement of three diameters makes the granularity painfully apparent; it destroys all sharpness. It is, I think, very common to find the most rapid emulsions rather granular, whether gelatine or collodion.

I have written at some length on this subject, as I am persuaded that the matter is one which it is of great importance we should understand more thoroughly than apparently is at present the case.

Perhaps you will remember that I sent you, a year or two ago, a slip of sensitised paper which had been treated after washing with carbonate of ammonia, and of which a portion had thereafter been dipped in a solution of common salt. I sent you the slip, and heard no more about it. The slip had been exposed in a printing-frame to a strong light for many hours, and it was long before any change of colour was noticed, especially in the salted end of the slip. The experiment was tried with the idea of noting the fixing effect of carbonate of ammonia, and, also, the retarding effect of a soluble chloride.

Lately I have, again, allowed a slip of paper (chlorised) to remain in a saturated solution of the carbonate for fifteen minutes, and then rinsed it in water. This paper has been exposed for thirty hours to a strong light, during many hours of which direct sunlight poured full on it. At the end of this time I find the paper rather yellow, especially as compared with a portion that had been shaded during exposure. It is necessary to allow the paper to remain a full time in the carbonate, and probably two baths, with a rinse between, would be better than one. If the paper be merely immersed for a short time it will change colour on exposure to light sooner than the merely washed portions, becoming at first of a bluish tint as compared with the brown of the merely washed part.

I have printed and toned a print in the ordinary way, then transferred it, after washing, to the carbonate for fifteen minutes, and then rinsed it in water. This print I now have by me, and, though I find it may be necessary to rather over-tone prints treated in this manner, it looks quite presentable after many hours' exposure to a strong light in a hot frame. It is of a brown colour, owing, doubtless, to under-toning for this particular treatment.

Who will undertake to say that silver photographs treated properly with carbonate of ammonia are not as permanent as any other photographs on paper?

The experiment is interesting, at least, from the fact that it shows the power of carbonate of ammonia in "fixing" the print to, at anyrate, a very considerable extent, if not altogether; and I see no reason for saying that it does not. We know the solvent action of the carbonate on the silver albuminate, and, as far as my knowledge extends, there remains only the silver chloride to remove. To what extent this is removed, and under what circumstances, further experience will show.

I have made a practice for some time of adding a portion of a solution of carbonate to the bath for fixing prints. I urge all those who continue to use the "old process" not to omit to do the same, and not to use the hypo. more than once, nor expect too much from its solvent action. "Better overdo than underdo" is a good motto in this case, though certainly not in all cases. I send you the print in question; it is rather over-printed for the carbonate bath.

I have some experiments for obtaining paper negatives and positive enlargements at one operation in hand at the present time, and I think they promise well. The process is simplicity itself, as far as I have yet progressed; but I am finding an impediment in the matter of the tones of the positive prints. I can get, as yet, only black tones by reflected light, though by transmitted light, before toning in gold or copper, the colour is of a good, warm purple. I will, with your permission, give an account of my results in this direction in a week or two, though it is possible that the process I am trying for will have to remain in abeyance for some months to come. To avoid raising the expectations of any of your readers to too high a pitch—a thing not unlikely in a matter of this sort—I will mention that I am dependent for my results on the poor, despised silver salts! If I am original in this matter it is in the method of applying my means. Herbert B. Berkeley.

P.S.—With regard to the experimental print which I enclose, I find that, after several hours' additional exposure, the action of light is visible on it. The enclosed piece of "trimming" from a toned and fixed photograph was placed over a portion of the print while in the frame, and I now find, after exposure to an intense sun, that the shaded portion is bluer in tint than the exposed part.* I really am inclined to think that the shaded portion has altered in colour more than the exposed part, for the shaded portion appears to me to be much more purple than it was. I should have cut the print in half before exposing.—H. B. B.

PHOTOGRAPHY REGARDED AS A MEANS OF "TEACHING THE YOUNG IDEA HOW TO SHOOT"—GEOGRAPHICALLY.

Some time ago a German *savant* threw out a suggestion to the effect that a much more extensive use might be advantageously made of photographs for educational purposes than is done at present. The idea, though far from new, is worthy of more attention than has as yet been bestowed upon it, and might, I think, easily be put to practical use. No reference is here intended to the cultivation of a taste for art (which has undoubtedly been fostered by the facility with which photographs of the greatest masterpieces, both of sculpture and painting, may be procured), nor to the aid afforded by photography to almost all scientific inquirers and teachers, but to one of the humbler branches of education presided over by our latest national institution—the School Board.

School Boards, of course, concern themselves principally with the teaching of the three *r's;* and though they do sometimes give undue prominence to the fourth *r*—namely, religion—yet they do not devote their attention exclusively to this magic letter, and I fancy there are few schools under their control in which geography is not taught, and which do not possess several large maps.

Every teacher knows the difficulty with which children—especially young children—grasp an idea in an abstract form, or one which is presented to them in skeleton, so to speak, by mere verbal description; and how quickly they seize and retain the same idea when presented to their eye in its actual objective embodiment. From this knowledge has sprung the present fashion of teaching everything that can be so taught, from anatomy to cookery, by demonstration, and where actual subjects are not procurable to replace them by pictures.

Might not this principle be extended with advantage to the teaching of physical geography, as it has already been to almost every other branch of natural history? In other words, would it not be well to supplement the fleshless skeletons, or ground plans, called maps, by a collection of photographs of the principal natural features of the countries laid down upon them. These pictures would then hold the same relation to the maps as the model of an animal does to its skeleton, or as a perspective drawing does to a ground plan.

A collection, however small, might serve to give the pupils a glimmering idea of what is meant by a mountain, a river, a harbour, &c. For an elementary school perhaps a dozen pictures of some of the most remarkable landscapes or pictures of our own country would be sufficient; and the hope may not be vain that some School Board anxious to distinguish itself may set the good example of presenting to every school under its charge such dozen views to form the nucleus of a collection.

To any enterprising photographer in search of a novelty I present the suggestion that he should bring out a portfolio containing one or two dozen landscapes of a large size, suitably mounted, and selected for their usefulness to schoolmasters in teaching the geography of England; but I would at the same time recommend the enterprising one that the beginning of the scholastic year is at hand, and that schoolmen have a proverb which says "*bis dat qui cito dat.*"

So much for elementary schools. Those of higher pretensions might have larger collections, or they might "go in" for lantern slides, as is largely done in America, where the magic lantern is a powerful educational engine, and has not yet degenerated into the mere plaything it is so generally here. The writer knows of at least one large school in Brooklyn where the lantern has been used for the purpose of teaching the young idea how to shoot—geographically.

A Domine.

NOTES ON OPAL GLASS AND PORCELAIN.

No. II.

The point left under consideration at the conclusion of my last *Notes* was—whether it was possible to prevent the discolouration of the surface of opal glass by any means. Having found the cause of the stain to be the sulphur of the atmosphere, it seems plain that two courses are open to us, viz., firstly, to obtain a glass without lead; or, secondly, to seal the picture completely against access of air.

As it is highly improbable that the manufacturers, in view of the exceedingly limited demand by photographers for this article, could be induced to make any alteration in their formula, if even it were possible to do so—for glass-makers are most conservative in the matter of formula—we must look to the second course only, namely, the sealing of the surface from atmospheric action. This may be done in two ways:—Firstly, by cementing a piece of transparent glass to the opal, so as to be perfectly air-tight, which could be done either by cementing the two together bodily by Canada balsam or by cementing the edges alone; secondly, by applying a coat of varnish to the picture when finished, or to the surface before receiving the picture.

It is evident that the first method has the elements of complete certainty in its favour, but with the accompanying disadvantage of increasing the weight and bulk, already inconvenient when framing comes in question, not to dwell upon the degradation of tone induced by so much glass, and we have thus finally to consider some method of varnishing. For delicate pictures the disadvantages of varnishes are manifold, one leading objection to their use being the fact that nearly all varnishes gradually discolour as they age. This is especially the case with bleached shellac; and I should advise all photographers to hesitate before using so treacherous a medium. Some years ago it was recommended to be used in aqueous solution with carbon pictures to fill up the pores and destroy the rottenness of the surface when it came to be painted upon; but in my own practice I have always set my face against it, whether rightly or wrongly, and never employ it, so that I have only theory to advance against its use.

But, leaving this even as an unsettled question, there are other substances which may be employed that are not open to such objection. I daresay it will be at once surmised that I allude to albumen or some form of gelatine. The action of the air in a well-secured frame is so very slight that I think a thin coating of albumen, particularly if rendered insoluble by any of the well-known means, should be all that would be needful to protect the glass, and hence the picture, from the deleterious influence. Gelatine may be used, if preferred, when rendered insoluble by chrome alum. In pictures in carbon by the double-transfer process it is, of course, already in use as a coating only, and care must be taken that it is sufficiently thick, as, if too thin a coating be used, an unpleasant effect of irridescence makes its appearance.

I believe Mr. J. A. Forrest, some years ago, introduced a cream-tinted opal glass to have more the effect of ivory. I never tried it, and it is possible, though I think not probable, that in its manufacture the lead might not be used. A similar appearance may be obtained by backing up the opal glass with a bright-coloured paper, orange or red, the glass not being opaque enough to entirely hide objects at the back; and for this reason it is always necessary to put paper of some kind at the back of the picture when framing, as otherwise any discolouration or unevenness in the backing would show upon the ground of the picture—if it were a vignette, for instance. A similar effect is frequently attempted to be obtained by means of a thin wash of water colour, and in the opinion of some artists the effect is very good. This would be one means in combination with the albumen of protecting the glass from sulphurous gases.

Dismissing the subject of that class of discolouration—which, I think, I have conclusively shown to be from some form of sulphur in the atmosphere—I will now address myself to another series of marks or stains most difficult to remove, namely, those left behind when a carbon picture has been allowed to dry upon the opal. It is, of course, quite easy to remove the main portion of the picture, but there is often left behind a ghostly image of some of the darker parts of the picture that almost defy removal. Boiling or long-continued soaking in water will not affect it. In my own carbon work I have generally had recourse to grinding with fine sand, giving it to one of the juniors to look after; but this is generally so inefficiently executed that the surface is usually marred by scratches. Lately, having found several plates spoiled with the stains from the remains of old prints, I have tried to devise some more satisfactory method of getting rid of them than the laborious rubbing, and I am happy to say that the method I finally employed removed them entirely without any difficulty. It merely consisted in dissolving a little caustic potash in a small quantity of water, smearing the surface over with the mixture, and allowing it to remain for a day. Disintegration of the surface most likely occurs, and, with a layer of glass, come away also the traces of the picture.

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* The tone of the two prints enclosed is warm and pleasing.—Eds.

When collodion pictures have to be removed from opal the photographer's resources in the shape of cyanide or nitric acid are amply sufficient.

That there is considerable difference in either the state of the surface or the make of the glass itself seems to be very likely from its behaviour with the bichromate. When the tissue is mounted some glass seems to hold this salt with the greatest pertinacity, no amount of washing serving to rid the surface entirely of the stain it gives, either on the image or the white margin with vignettes; and what renders it more annoying is the fact that when the stain is very slight it does not show until it is dry, when it becomes more difficult of removal. An opal carbon picture should always be examined before drying in the strongest light, so as to detect any trace of the yellowness. The method I have found most efficacious in removing it has been to flood the plate, before "aluming," with a pretty strong solution of ammonia; it has the effect of rendering the bichromate more soluble, and enables it to be washed out with much less difficulty.

Real porcelain—which, I think, is far to be preferred before opal—presents some difficulties of its own, and I will reserve my experience with it for a few concluding notes.

G. Watmough Webster, F.C.S.

STREAKS ON THE NEGATIVE.

About fifteen years ago, while working in a Southern city, I was troubled with transparent streaks and flashes running in every direction near the centre of the plate. The occurrence was very annoying at times, and I observed that it was more frequent in the afternoon than in the forenoon, and this circumstance now, to my mind, seems to indicate a solution of the vexed problem. At that time I was using a highly-sensitised collodion, and several years later, by some chance or for some reason that I cannot now call to mind, I made a sample of collodion with less of the iodide in it, and I found, after using it for several months, that my plates were freer from markings of all kinds and a total absence of this particular one under consideration. Believing that I had found a remedy I experimented in that direction, until I was satisfied the cause was in the collodion, and that the remedy consisted in weakening it about one-tenth its volume with plain collodion.

Now, my theory is this, in regard to these singular effects on the plate:—A strong or highly-iodised collodion is used, the bath is tested and brought up to the required strength before business hours, and all things are got in readiness for the day's work. It is, perhaps, a busy day, and by two o'clock the bath is reduced two to five grains to the ounce. Consequently, the harmony ceases to exist between collodion and bath, and the latter, in its weakened state and owing to the excess of ether and alcohol which it has accumulated through the day, is thus prevented from exciting the plate evenly, the alcohol and ether which is being disengaged or separated from the film shooting out near the centre in all manner of shapes, in more or less dense masses, through which the silver cannot penetrate and deposit itself on the plate. This is clearly demonstrated by the fact that a plate examined by transmitted light (before exposure) reveals all these markings. Now, a less quantity of iodide has the effect of restoring the harmony and keeping up the equilibrium while exciting the plate, causing the spirituous fluids to be disseminated through the bath solution with greater facility and regularity, giving a uniform film, though the bath may be run down far below its maximum strength.

In view of all these considerations I have changed my manner of working, and have gone to the other extreme, as some may think, and am using the twenty-grain acid bath with very great success. It is in my hands far superior in some respects to the forty-grain bath, and gives more detail and softness, both in the shadows and in the lights. The intensifying is very easy, and can be brought to any required density. I do not discard the forty-grain bath, however, as I can generally get the effects I want on different subjects by changing baths as required. Equipois.

—*Practical Photographer.*

ON OPTICAL IMPURITIES IN ATMOSPHERIC AIR.

There are frequent cases in photographic practice where the representation does not accord with visual observations, where the objects are not strictly portrayed by the camera, but additions to the subjects, or even unexpected forms, appear, and the causes assigned, while they differ from each other, may be accepted as probable in those particular cases investigated. Thus the effects of blurring or halation or irradiation may all arise from causes interfering with the path of the pictorial rays, the reflections from the surfaces of the glass, or the effect of minute air-bubbles, or the unequal thickness or motion of the photographic films, as well as the unequal densities of the glasses used, may all have their influences. But there are times when, with exquisite apparatus, the practical photographer finds that with vast space and floods of light no picture can be taken, or the results are most uncertain; it is a sufficient phrase to say "the light is deficient in actinic power."

Very recently attention has been drawn to the appearance of light in different atmospheres by Dr. Tyndall; and as his researches have led to fair conclusions in several directions, by his logical and demonstrative experiments addressed to those who have to apply the laws of health for public welfare, so the time may not be far distant when his researches may prove of great value to photography.

Demonstrating that light itself cannot be seen, except by its action of illuminating bodies and noting the direction of a ray of light passing through a chamber or room, and boldly declaring that light is only seen by virtue of impurities of the air—in the air, in fact—Dr. Tyndall went on to demonstrate that when all matter was filtered or separated out of the air in the chamber then the ray could not be seen. He proceeded to add—given impurity, such as floating saline bodies, water mixed with salts, &c., instantly the ray is made visible; thus the intense light of electricity passing through pure air or a vacuum appears black, and a spray of water and chlorate of potassa give the course of the ray a celestial blue.

The course of investigation led Dr. Tyndall to this important conclusion—that the decay and putrefaction of animal and vegetable substances in the cases he was investigating owed these changes to foreign bodies or living atoms which, floating in the atmosphere or settling from it, set up these changes. In experimental language, the air being pure, allowing light to pass in a state of blackness was an atmosphere where substances could be kept without decay; but when the sunbeam could be seen then decomposition soon took place. To get a pure atmosphere, free from the germs of life, or, to put the matter plainly, free from being loaded with the germs capable of infecting and destroying animal and vegetable substances, he showed the simple demonstrations of closing the air-chamber, so as to have no current or drifting power, and then the air, beautifully luminous when a ray of light was sent through it, became quite black, or non-luminous, when the germs and dust fell by their own gravity, and mostly died. Secondly: he filtered the air through prepared cotton wool, and readily obtained air optically and chemically pure.

There are few persons that have seen the exhibition of the electric light in the open air but must have observed the strange, cloudy, rapid motions of the substances in the air; how the light at one time shot through dark spaces and almost instantly seemed in palpable conflict with air or vapours, for they appeared like silvery cotton clouds in rapid motion. Let us apply these simple facts to photographic practice.

Take an interior where the subjects are absolutely stationary, plenty of light, and yet the exposure is very long; at last the picture is taken, and what is frequently found? Not the subjects seen entire, but some portions absolutely not shown—no matter whether of stone or iron, they are not shown—but something else becomes apparent not expected by the public, viz., an absolute white patch or cloud. In cases that can be referred to—say of the interiors of St. Peter's at Rome or of St. Paul's in London, and many others—there are found, with the most delicate detail and the sufficient relief and distinctions in the shades, also the absolute absence of some portions, and the presence of forms—light, large patches, like white wash—on the exalted roof, or, in fact, as if the building were cut away. Around the windows every form is obscured or altered as effectually as if they were bordered with white cotton wool. At hundreds of feet from the spectator the light illumines the air loaded with chemical impurities, and these are in their minute and collective aggregate shown to exist, but no trace even of the building or architectural detail can be seen. True, those who look with a professional eye at once say it is irradiation, &c., but to the world does it give the truthful view expected and required?

In the case of the transept of St. Paul's, the window above the organ has all form removed; there is one luminous space, and here one can imagine the dust and germs may settle, or be set to float with vibratory currents, so that a cloud may always exist there or be raised at a very short notice. But the cases I have quoted can instantly be supported by an appeal to any collection of photographs of interiors where time has done its work and cleansing power is not readily available. The point I wish now to insist upon is this—that the detail, the building itself, is not photographed, nor can it be photographed, but the air is—the chemical impurities; and the optically-impure air is so palpable that it refuses to allow anything else but itself to be represented.

Accepting this state of things, it might be asked—May not this explain the effects of a small ray of light in the camera itself or the interferences in a studio?

It has been noticed that the best work has been done when the studio has been sprinkled with water. So, in the open air, after gentle rain the air may be exquisitely pure; but soon the still atmosphere shows a silvery brightness that may be due to the floating impurities. The fine tints and shadows seen in some atmospheres and in some waters are gems of beauty for the painter, and by him sought for and cherished; but the photographic artist may fear and shun the optically-impure atmospheres.

There is no wish to pursue this subject to the utmost, but to call the attention of the army of amateurs and philosophic observers to the causes at work whose influence and force interfere with the best practice. To some observers the appearance even of subdued light, or partial light, has been found coincident with the presence of health or disease—in that district, for instance, where Mr. Glaisher has seen a certain blueness in the light between groves of trees, and has consulted the statistics of health and death, and found coincidences he has long since pointed out. Here, then, the eye can detect the influence of bodies probably as yet unknown—perhaps ozone or antozone—and photography will be called upon to record such appearances. The photographer with his chemicals, his plates, and his papers may find here some fruitful causes of interference; and the history of dust and the routine of practice may be rendered more satisfactory by knowing the causes of optically-impure air.

To the philosophical observer, too, it may be a possible explanation of some difficulties or anomalies in practice. Thus the leaves of plants and trees, each surface having a different set of powers with light, may be yielding such currents of impure air that even without wind their indistinct forms may be attributed to bodily motion, besides, it may be added, their possibly changing power of decomposing light. On one occasion, at a friend's house, with a declining sun, every leaf and every flower seemed to have the power of polarising light. The spectacle was brilliant in the extreme, but seemed to alter and to fade—perhaps owing to the influence of the suburban villas—if there be local sources of decomposition, as in masses of vegetation, where every leaf has its appointed functions. Perhaps more attention will bring new facts and explanations, dependent upon our knowledge of atmospheric air chemically and optically considered as pure or impure.

Thos. J. Pearsall, F.C.S.

PHOTO-ENGRAVING.

This process is founded upon the fact that copper plates prepared for yielding impressions in printers' ink possess a highly-polished surface which represents the high lights of the picture, and indentations, either in lines or in grains, which represent the shadows. It is of no consequence that the size of the grain formed in the bottom of the deep hollows should be larger than those in the shallow or smaller ones, which represent the half-tones—a fact that will be apparent when it is considered that the brown of the engraver makes markings of precisely the same character whether they be deep or shallow. The half-tones or deep shadows depend upon the width and depth of the indentations. Such portions of the surface of the plate as are free from grain must possess a high polish, so as not to allow any ink to adhere to them, by which the purity of the whites in the proof would be lowered.

This principle in copperplate engraving is well known, and neither for originality in these remarks, nor in giving a grain to the gelatine in the process to be described, do I claim any credit. I do, however, claim as my own a certain practical application of these principles in making use of two films of gelatine—a thick one containing granular matter, and a thin one quite free from grain—and it is in the latter that is to be found the chief feature of my process. Without that film the blacks would be heavy and dark to too great a degree, but by its agency half-tones of great delicacy are obtained.

The half-tones being formed by an exceedingly thin film of gelatine, the grain will be protected by it even if that grain be very fine. When the film is dried the grain will be in relief, and from this may be produced a plate that will be reversed, the deep shadows and half-tints being sunk in the plate.

Having given the theory of the process, I now proceed to give a detailed, practical account of the method by which images of great fineness may be obtained. The paper is prepared according to the following formula:—

Water	32 ounces.
Gelatine	6½ ,,
Chinese ink	6 drachms.
Finely-powdered pumice stone ...... about	1 drachm.

Let the pumice stone be added slowly, and by small pinches at a time. It must be well incorporated with the gelatine, otherwise it will predominate in some parts more than in others, the result of which will be inequalities in the nature of the grain produced. It is always well to err on the side of adding too little rather than too much.

I prefer using pumice stone to any other powder of a similar nature, on account of the peculiar degree of grit it possesses. On account of its lightness it remains a long time in suspension without falling to the bottom of the gelatine, by which inequalities would be produced. For the same reason I prefer to employ a solution of gelatine of twenty per cent.; for, on account of its thickness, it both allows the pumice to remain in suspension and sets upon the paper before the powder can get time to be displaced.

It is also important that the gelatine solution should not be too hot at the time of pouring it on, no greater degree of fluidity being desirable than will suffice for the gelatine to flow evenly over the glass when it is slightly tilted, to allow of its being spread equally.

Before adding the pumice powder the solution must be filtered through linen, and in my own practice I filter twice. The gelatine is maintained in a fluid state by keeping it in a vessel which has been placed in a hot-water bath.

When about to use the solution I shake it up in order to ensure the proper distribution of the pumice, and, the mouth of the bottle in which it is contained being covered with linen, I pour it upon the plate. By this second filtration the air-bubbles which are formed by the shaking up of the gelatine are prevented from flowing upon the plate, which must previously have been moistened with ox-gall. Care must be taken to keep the gall in a sufficiently hot state.

The surface thus obtained will be exceedingly fine, the gritty powder being enveloped in the gelatine, the atoms not appearing in relief when dry. But if the very finest results are not required the coating of gelatine may be applied to a sheet of waxed paper moistened. In short, the whole requirement is a sheet of paper coated on one side with a thick layer of gelatine containing a very fine powder of a gritty nature. This paper, after being dried, may be kept ready for use when required.

The next stage is that of sensitising, which is done just before requiring it for use. It must be immersed for one or two seconds in the following solution:—

Water	16 ounces.
Gelatine ....about	3 drachms.
Bichromate of ammonia	4 ,,

This must be warmed very slightly, so as to keep the gelatine in a fluid state. This paper is immersed, with the gelatine side uppermost, and air-bubbles are removed by rapid treatment with a glass rod. It is then dried, when the paper separates quite easily.

Having already explained how useful and indispensable is the second film of gelatine, which contains no gritty powder, it is needless to say anything further on this point, unless it be to observe that it entirely obviates any necessity for burnishing the whites, and enables the most delicate parts in the photograph to be reproduced. Sometimes drying-marks are produced on the surface of the gelatine, as well as other markings, caused by the alcohol by which the gelatine is hardened previous to its being used to give an impression in lead, and these markings may require an application of a burnisher to the metallic plate.

When the paper has received the second film of gelatine, and has then become sensitised, it is dried in a dark room, cut to the size of the negative, and is placed in the printing-frame with a negative, as in carbon printing. The exposure to light will be a third or more longer than would be necessary in carbon printing. If very deep lines are wanted the exposure must be still more prolonged, even to double that mentioned.

When the paper has been removed from the printing-frame it is pressed in contact with a plate of polished steel or copper, by the same process as that made use of in carbon printing. The image is then developed by hot water, care being taken that the water is not too hot, as that would endanger its adhesion to the plate. My object in making use of steel or hard copper is to allow of an impression being obtained from it by means of pressure under a hydraulic press. A sheet of lead is employed for this purpose, and this being superposed upon the plate containing the image great pressure is applied either by the hydraulic press or, if that cannot be obtained, by passing them between a pair of rollers. In the latter case the lead is covered by a plate of zinc, and pressure is applied until the whole of the details have been impressed in the lead.

The lead plate engraved in this manner serves as a matrix from which to produce plates in copper by the electrotype process, and the impressions in printers' ink are obtained from the copper plates thus prepared. M. Despaquis.

—Le Moniteur de la Photographie.

NOTES ON PASSING EVENTS.

By a Peripatetic Photographer.

A glance at the list of names of jurors appointed to make the awards at the forthcoming exhibition of the Photographic Society of Great Britain will satisfy those acquainted with those gentlemen that the jury this year cannot reasonably be chargeable with inefficiency for the task entrusted to them. I shall be somewhat curious to see what shifts are resorted to by exhibitors to over-ride that bit of advice which says that "each frame should have the artist's name and the subject written in front, capable of being detached as soon as the catalogue has been made out. No other marks should appear on the picture." Now, as exhibitors have in times past (with the exception of those who possessed a tender conscience) treated such recommendations with contempt, the question arises whether it would not be more dignified if, instead of recommending such a course as that described, the committee would adopt the potent word "must" for the indefinite "should." As it is, I fully expect that at the forthcoming display numerous pictures will be exhibited upon the frames or mounts of which will be emblazoned, in letters of shameless magnitude, the names and addresses of the exhibitors. But two months is by far too short a time to give photographers to prepare their pictures. If the managing committee of the exhibition were really desirous of making the affair a success, particulars should have been furnished to the photographic world long previous to the 27th of July, seeing that pictures must be sent in prior to the 2nd of October. If the exhibition prove a failure the cause will not be difficult to discover.

It was by no means a pleasant thing to have to take photographs under the circumstances described by Mr. Edward Pocock, who, being obliged to operate in a country where, during a dastardly attack, he and his horse were brought to the ground and himself jumped upon and his pockets rifled of their contents, was under the disagreeable necessity of drawing his revolver and firing at the five Bashi-Bazouks by whom he was assailed, knocking one of the scoundrels over at the first shot. It might seem strange that not one of the other members of the attacking party had the pluck to fire a shot to revenge their fallen comrade; but perhaps this may be accounted for by the intense dislike entertained by many otherwise brave men to face a camera and a photographer. Even the "Peripatetic Photographer's" nerves are subjected to a strange kind of tremour every time he sits down upon the operating chair in a photographer's studio. Fortunately, in these Arcadian latitudes the only weapons of defence or offence required by a photographer out for a ramble with his camera are comprised in a tripod strong enough to scare away the bulls, dogs, or farm labourers of antagonistic proclivities that *may* be met with in one's rambles, but which in prosaic life are never seen.

How pleasant it is to find that stereoscopic photography, although, unhappily, wellnigh a thing of the past in its native clime, still possesses active life in America! In the description of the stores of Messrs. E. and H. T. Anthony and Co., New York, I find that the care of this class of picture is assigned to a "bevy of girls." There is no establishment in this country of which this could be said—more's the pity! Here I ask myself if the cameras so much in use at the present day by nomadic photographers are favourable to the requirements of stereoscopic photography. An 8 × 5 camera is very useful either for producing one picture of effective dimensions or two similar or dissimilar 5 × 4 views. But, in the latter case—that is, when treating the picture from the binocular point of view—the pictures are each of too large dimensions to be utilised for the stereoscope without a great deal of waste in trimming them to the regulation size. This is only objectionable when the views are to be printed upon paper; for, if the more attractive form of transparencies be adopted, and a copying camera employed, the whole subject can easily be reduced to such an extent as to be got into any required dimensions.

The fillip recently given in this Journal to the adoption of cloud negatives upon paper for printing-in by a subsequent operation—that great adjunct to a fine landscape—reminds me that I have recently seen several otherwise charming landscapes spoiled by being quite untrue to nature, owing to the incongruity existing between the subjects on *terra firma* and the clouds in "that huge dome which rears its ether arch above the world." Clouds frequently assume forms of such fantastic shape that, in examining the reality, one is forcibly reminded of the dictum respecting truth being stranger than fiction. But, apart from form, it must not be forgotten that the lighting of a cloudy sky must be in harmony with the lighting of the landscape, to which the sky is a necessary accompaniment. This point appears to be very much overlooked by some photographers. Again: occasionally so little care is bestowed that the clouds are turned upside down, apparently without the photographer being aware that a sky gemmed with fine clouds has an up side as well as a down side. If it were required to print-in figures in a landscape the photographer would not so place his subsidiary negative as that the feet of the figures should all point upwards; why, then, should he commit an error equally at variance with sound principles by inverting his clouds?

With all due deference to the opinion expressed by Mr. Peter Chr. Koch relative to the cause of oyster-shell markings on negatives, I have arrived at a different conclusion from that gentleman. One day last week I got quite a large number of these markings on several plates treated in consecutive order, and I then thought this would prove a favourable opportunity for testing the accuracy of Mr. Koch's hypothesis. I accordingly immersed a plate *very slowly*, but as the markings were as bad upon its surface as upon those of all the others, I conclude that his remedy is not suitable in every case. By long draining in a moist atmosphere I was quite successful in getting rid of these annoyances.

(To be continued.)

SIEMENS' PRESSURE-HARDENED GLASS.*

In spite of its higher price, the employment of pressure-hardened glass is ensured, as the difference of price is partially compensated for by the fact that the pressure-hardened glass can be used much thinner than ordinary glass, and that it can be used for many purposes for which the latter is too brittle. Pressure-hardened glass is recommended for the following purposes:—Glass roofs for factories, railway stations, passages, machine-rooms, &c.; as window panes, either plain, ground, ornamented with a pattern, painted, stained, or opal. It is adapted for houses of business, for swing doors, and carriage doors and windows; for transparent screens, signals, and boxes of all sorts; for aquaria and partitions. Grooved or roughened it is suited for floors when it is necessary that they should be translucent. Lastly: it is useful in all cases where great durability is required for a foundation for an expensive painting or pattern. Pressure-hardened glass may also be used as panes for doors and windows for lighting the interiors of kilns or ovens, or in any other case where the glass is submitted to an unusual variation of temperature. But it would be impossible to give a complete list here of all the modes in which hardened glass might be utilised instead of ordinary glass, and there is no saying how far it may come to be employed as a substitute for other materials, such as wood, tin, slate, or stoneware.

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By suitable experiments one may easily convince himself that the extraordinary resisting power possessed by pressure-hardened glass far exceeds that of all other sorts of toughened glass, and the fracture is quite different from that of the sorts already known. The fracture of pressure-hardened glass is fibrous, that of glass toughened in a bath is crystalline. Pressure-hardened glass does sometimes break with a crystalline fracture, but in that case the plates are more brittle than those that have a fibrous fracture, and are, besides, very liable to break spontaneously—an unfortunate property which has often been attributed to ordinary toughened glass. Hardened glass, having a crystalline fracture, can neither be ground or bored, and as soon as the surface is broken it explodes into a thousand pieces; but, in spite of its greater resistance to pressure, this is not the case with pressure-hardened glass.

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* Concluded from page 318.

In conclusion: it may be remarked that, in consequence of the impossibility of cutting the pressure-hardened glass, the process of placing the panes in roofs, windows, &c., is different from that usually employed. At first this will frequently be made an objection to the use of the new glass on the part of glaziers, as they are generally unwilling to do anything in an unusual way. Herr Siemens has, therefore, engaged to make arrangements for glazing being properly done in all large works.
—*Polytechniches Notizblatt.*

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LIGHT AND SHADE.

[A communication to the Boston Photographic Association.]

There are two indispensable elements required by the artist, viz., light and vision. Light is an element of nature, existing without and independent of ourselves, free to the use of our natural and rational faculties, whilst vision is a part or power of, and belongs exclusively to, the individual. Having the perfect sense of vision, the beautiful colours of the external world and the infinite variety of the forms of natural objects are presented to us through this sense for contemplation and enjoyment.

The human mind is progressive, receiving at first single ideas and confused impressions through the visual organs, afterwards enlarging and expanding, until a general or universal view is embraced, and comprehended with avidity and delight—from a single colour to a union and combination of all the tints of the prism—from a single line or form or individual to a multitude of forms and objects, all grouped in the never-ending arrangements of animated nature. The uses of light and vision come to us at first as it were accidentally, but after a little experience they become a necessity indispensable to our happiness; and the deprivation of either would be a calamitous infliction. By attention and study we increase our faculties of observation, and become conscious of new delights and new influences in the contemplation of nature as spread around us and laid at our feet. We soon learn that nature is ever changing, that the forms and colours of yesterday have today become new in their groups and effects, and all experience teaches us that this changing is always in progress over the external world. Observation teaches us the beauty and variety of those changes, and we soon learn to view, passing before us, an all-pervading panorama, and begin to feel that we can comprehend only a very limited part or portion.

Our profession is to catch here and there some faint outline or representation, that we may preserve for a space that part of the view in which for the moment we think we have some interest. The manner of doing this, as it at present interests us professionally, is by the aid of the newly-discovered art of photography, by representations in light and shade or *chiaroscuro*, which, defined from its original Italian, is compounded from *chiaro*, "light," and *oscuro*, "dark." These terms appear almost inseparably connected, as, if we clearly perceive either, we of necessity have at the same time a clear conception of the other, the presence or sense of one being not supposable but with the absence of the other. Vision is properly the act of seeing or perceiving external objects by and through the organs of sight, or the eyes. The terms "vision" and "seeing," for our purpose, mean the same thing, though seeing may be considered the acting of the visual organs, and vision the resultant effect of their action.

To analyse fully these two terms—"vision" and "*chiaroscuro*"—would require volumes upon volumes on science and philosophy. The field for the study of light alone is almost illimitable in extent, as well as exhausting and sublime in its character, standing next and nearest to its creative source. The subject of my address, then, may properly be stated as vision or seeing, and light and shade. With their science and philosophy I shall have little to do, whilst my main effort will be directed to the point of impressing you with the importance of devoting your most energetic and persevering efforts to obtaining a practical knowledge of their proper and most effective use.

No time need be spent before such an audience as this in explaining the object of obtaining such knowledge. To all and each it is of vital interest and paramount concern, in a professional point of view. All possessing the ordinary visual organs should be able to see nature as it is. The power to comprehend artistically any landscape presupposes the power to comprehend artistically any other. The power to judge and appreciate beauty implies a power to judge deformity also, and every intermediate grade. The capability of determining the existence of beauty of form and expression in one person is followed necessarily by the same power in the same respects to estimate the same or opposite qualities in all persons. The power to estimate beauty in nature is the same as to estimate its representation by whatever method it is attempted to be shown, whether in models or drawings. But all experience tells us that these are faculties not often possessed, and when so possessed are acquired only by a long, careful course of training of the vision, placing such a scholar next in acquirements to the artist who is able to produce the model or drawing of nature.

He, then, who can see nature as a picture stands next to him who can make such a picture. But not all who attempt to model or draw have learned to see correctly; and, indeed, but very few, if we judge by their productions. History has recorded but few names, of any one age, renowned for modelling or drawing or painting in colours; and, comparatively speaking, there are but few renowned names handed down to us of eminently distinguished sculptors or painters, and but a very small number of these have rivalled in any degree Nature herself, but have fallen far behind her. Why has it been so? Not because of the mechanical difficulties of execution; for the world is full of mechanical models far surpassing any niceties of sculpture in its chiselling and smoothing, and of far greater exemplifications of physical ability than the mixing of the colours or outlining of the pictures that cover the walls and ceiling of the Vatican.

Albert S. Southworth.

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MY STUDIO.

Operator No. V.

In my time I have had many operators, but one of these deserves special notice, he was such an eccentric fellow. He seemed to possess all the qualities required to make a good man; but, somehow, he turned out to be all made wrong. Once the possessor of an establishment in the north, owing to a series of misfortunes he had to give it up. Some of the things that went dead against him were as follow, just as he related them to me:—

"You see, sir, I was getting on well enough until one day I hired a horse to go out and take some views—a job I had got. Well, I wasn't more than half way when the brute took the staggers on the road and dropped down dead, smashing my apparatus and materials, and doing no end of mischief. But that wasn't the worst of it; for the man from whom I hired the horse sued me for the value of it, and the sum was forty pounds. My father was awfully wild about it; however he paid down the money, and I got out of the scrape. But the thing that put my father most against me was buying a cow."

"Buying a cow!" I exclaimed.

"Yes! you might well look surprised; but that was the fact. Some of us were at a fair up at our place; and being on for a lark, and our heads not being quite so clear as they might have been, I thought I would like to have a cow. I had some confused ideas of taking it home to use as a model from which to produce artists' studies in all the beauty and with all the truthfulness of animated nature. Having my father's business card upon me I gave it to the proprietor of the cow, and said he would square with him. My father being well known the former accepted it at once, and I and my purchase went on our milky way. But getting short of money during the afternoon, before leaving the ground I sold the cow to raise the wind, and of course the money melted away—evaporated in spirits. When I came to my senses I couldn't think of going home, knowing how my father would feel, and so there and then I came away on the tramp."

"And this love of nature in the shape of horses and cows is not a mania with you?" I inquired, with a smile.

"Oh! no, sir! I can assure you that cow was purely an artistic freak, and I thought I saw money in it."

Well, he showed me specimens of his work, which were very good indeed, and I engaged him; but I must acknowledge that he never produced the same class of work in my place. In fact the work was bad, and trade was bad, and I was just at my wits' end to know what to do, when, one morning, I was sitting in the small printing-room unknown to my operator, and overheard and saw some little things which, to some extent, furnished an explanation as to the badness of the pictures as well as the badness of trade.

Hearing a lady conversing in rather an injured tone, I looked through a little hole in the door, and fixing my attention I heard every word that was spoken.

The lady said:—"I really don't like the picture; it is anything but a pleasing likeness."

"I'm astonished at that opinion," my manager replied; "I think it a first-rate picture of the original."

"And none of my friends like it either," the lady said, getting warmer as she continued.

"That may be their want of taste, madam; it is useless casting reflections on the sun," was the cool reply.

"I don't want to cast reflections on the son or the father either!" the lady exclaimed, in a white heat, and evidently misunderstanding the meaning of the remark. "I want to sit again."

"I think it would be useless. I couldn't make a better picture of you; even with retouching, nature could not stand more than this."

Nor did it; for down went the pictures with a smash on the desk, and turning on her heel the lady rushed down stairs without another word. Humming a sweet air of unconcern the hero of the situation walked into the dark room.

"So! so!" I sat ruminating; "and this is how the trade is going—downstairs never to come up again. It won't do. Now I wonder if this is an exceptional case," I was asking myself, when another customer was announced. It was a young fellow, seemingly of quiet, unobtrusive manners. The hero got him all fixed, and after getting his plate prepared was taking a last look before putting in the slide—

"If you go on shaking like that you'll never get a picture this side of time," I heard him say. "Can't you keep still?"

"I think I am still," the young fellow answered, with a sheepish, nervous, uneasy look upon his face.

Anyone with half an eye would have seen that it was useless to expose then; but my hero fired away. He went into the dark room and developed the pictures, then returned with the following information:—

"You'll never make a good picture;" and, showing the double negative against his focussing-cloth, pointing to one of the pictures on the plate, he remarked—"But this one will do when it's touched up, I think. Leave your name and address down stairs."

The next sitter that appeared upon the scene was a child of three years of age, accompanied by her nurse. The child was a very pretty, dark-eyed little thing—just a gem for a show-case. The nurse wanted to stay, but my hero said—

"No, mum! I can do the picture much better alone. Just be so good as to go down to the waiting-room."

The maid looked at the child, as she said—"Might I not sit back here, sir, out of the light. It will give her more confidence, and she is so timid."

"Oh! no; never fear; if you go to the waiting-room I'll get the child all right."

Away the maid went, and in a moment a cloud settled over the child's face. When he had the plate prepared I expected him to draw the child's attention by ringing a bell or playing the musical box, or bringing that everlasting bird out of the camera. Oh! dear, no! he was far too original. You may guess my feelings when—everything ready—he walked up to the table and, striking it with his clenched fist, said in an angry tone—"Look up and smile; and, mind this, if you move I'll choke you!"

The look of fixed terror the child then wore was perfectly appalling. And thus he took the picture—perfectly still, not a movement, but as much like the natural expression of the child as light is to darkness. But my manager was perfectly pleased, and went singing on his way. He had played his *cards* so well that he had taken me in with *some* that had never been productions of his own.

Determined not to let my business go to ruin, after this I was there every morning when we opened, and stayed on during the business hours of the day. This I continued for some weeks, attending to all my customers myself, and by this means got affairs into better order. My manager did not like this sudden interest and activity on my part, and so he sought and found another field of labour, where, I hope, he will be less demonstrative and more successful. MURRAY RUSSELL.

Contemporary Press.

SCATTERED THOUGHTS.

[PHILADELPHIA PHOTOGRAPHER.]

MY observation leads me to think that most country photographers are making their negatives on too small-sized glass for the size of the pictures made, at really greater cost, or poorer success, than they would experience if they would study more the economy of labour less the cost of glass. It is well known that one-fourth glass is too small to get good, even effects for *cartes de visite*. With the utmost care the collodion will be too thick on the side and end where the collodion is drained off, and there is the difficulty of flowing so that the draw lines of the film do not reach inward from the opposite side and end of the plate far enough to spoil or much injure the portion of the plate forming the picture surface. It is very difficult to get a smooth background on a quarter-plate, consequently it is rejected by the customer, though the figure itself be passably good, and quite frequently, without being able to say why, he knows he is not pleased, but does not know enough about the principles of art to see that it is the want of harmony between the figure and background. He relies upon the general impression it conveys to him, and says—"Somehow it does not look right to me." Now, the upshot of the matter is re-sittings, until both the customer and photographer are out of patience and out of pocket, for both suffer by the transaction. Again: the resulting picture is not only better for being farther from the edges of the plate, but when, as ought to be the case always, all that portion of the margin of the plate is shielded from the light except just enough at the centre to bear the image, and sufficient backgroud for the size of the picture desired, the plate is richer in free nitrate of silver to help to form the image, so that the effect is most decidedly better and the time of exposure somewhat shortened. For single negatives, card size, I would recommend 4¼ × 6½ plates to those who have not, and cannot afford, a camera box with some kind of sliding holders. There are several boxes of this nature, but I prefer and would recommend the American Optical Company's "imperial" box, 8 × 10 or 10 × 12 size. I have one of the latter size, double swing, and I am desperately in love with it. One with a single swing would answer almost all purposes in small galleries, yet I find the double swing a handy thing to take about. With such a box for cards, two exposures for card size on 6½ × 4¼ plates is much better than single quarters, 5 × 8 plates still better, and 4-4 plates decidedly best. Cabinet pictures to be printed vignette or medallion can be made two on a 4-4, or, better, all cabinets on 8 × 10 plates. Any live photographer making quarter negatives for cards can well afford to buy such a box, make double exposures, use 4-4 plates, and pay for it by an extra price of one dollar per dozen for cards, meanwhile getting compound interest in the pleasure it will give him. If any customer seems inclined to refuse to give it, make him two on a 4½ × 6½ at the old price, put extra effort on the extra-priced negatives and mount on finer cards, and all the extra cost will be more than made up in the extra pay, and no grumbling either. It will improve you, your pocket, and public taste all at once. Try it and see.

In order to print in a plain background where the original is faulty it is a good way to take a piece of the sensitive paper as large as the negative, paste it to the negative along the top edge, and expose until all the outlines are out; then take the negative out of the frame and turn the paper back on a piece of plain glass, and with a sharp knife cut out the figure, being careful to exactly follow the outlines of the face, hands, and white collars. If the colour be dark just a bit on the hair and drapery the mask will now replace itself exactly on the negative, unless the bottom of the mask be parted by cutting entirely, which is seldom or never necessary if the paper be a little longer than the negative. Replace the negative in the frame and make your print; it will be on a white ground. Take the figure that was cut out and stick its face to a sheet of glass larger than the print, so that it will allow the margin of the glass to extend beyond the print when placed in contact with it. Now take another sheet of glass the same size and lay a pad upon it; lay the print upon the pad and then the glass having the figure fastened to it over the figure of the print, so that it will exactly cover the figure of the print. Hold in contact with the fingers and expose to the light, moving the upper glass a little all the time to prevent printing a sharp line, and stop when the desired tone is reached. By the use of a bit of cardboard, cloth, or dark paper, or by standing where the sun casts a sharp-lined shadow, the ground may be graduated in tone in any desired direction. By this method I have printed or grouped two figures taken separately, or copied from unequal-sized pictures, and put in the background, so that no one not well up in double printing would have guessed the fraud on circumstances.

The background of pictures copied large from photographs may be much softened by pencilling a mask for the head or figure and using it as a mask for the figure of the print, re-exposing the background to the light in the same manner as above. Don't make the retoucher do what the printer can do better. Give the printer a little credit for brains and a little encouragement, because it pays.

F. M. SPENCER.

Meetings of Societies.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE monthly summer meeting of this Association was held on Thursday, the 26th ult. Some of the members taking advantage of the place of meeting being situated near the Dingle went there first, and, though the wind was rather boisterous, several negatives were secured, chiefly views of the rocks on the shore. Afterwards the members met together at the house of Mr. J. H. T. Ellerbeck, who had kindly invited them to take tea there. On the Vice-President, Mr. H. A. Wharmby, taking the chair,

The SECRETARY reported the result of the previous Saturday's field meeting at Bidston, by which it appeared that in spite of an exceedingly dull and windy day, giving no promise of photographic work, the meeting was attended by thirteen members. The first halt was made at the upper end of the Great Float, with the expectation of getting some views of the celebrated "Great Britain" steamship, but, owing to her being hemmed in by other vessels, it was found impracticable to obtain a full view. The party then proceeded on to Bidston. Here several views were found, the wind, however, being too high for photographing foliage. Several groups were taken of the members. After enjoying the splendid view from Bidston Hill and taking some views of the mill and lighthouse, the party returned to Liverpool about six o'clock, the wish being generally expressed that another Saturday's excursion should be soon arranged.

Mr. Ellerbeck, Mr. Pendlebury, Mr. Twigge, and the Secretary showed the views they had taken during the Saturday's excursion. The groups taken were considered very successful, and it was arranged that a mutual exchange of prints should take place.

Mr. E. Twigge exhibited a cover for preventing the escape of ether from the bottle while coating emulsion plates. This was a capsule of india-rubber, which opened by pressing a spring between the hand and little finger. It could then be lifted off the neck or shoulder of the bottle. It was, however, doubted whether such a contrivance would save much, as the greatest evaporation of the ether took place while the emulsion was being poured on and off the plate.

The Secretary was requested to ascertain whether any of the members had negatives suitable for enlarging for a presentation print.

A hearty vote of thanks was passed to Mr. Ellerbeck for his hospitality, and the members devoted the remainder of the evening to the inspection of negatives and other objects of photographic interest belonging to their host.

It was understood that the next summer meeting would be held at Claremount, Wallasey.

Correspondence.

REVERSING NEGATIVES.

To the Editors.

Gentlemen,—I notice in your article on *Single Transfer*, in last week's number of The British Journal of Photography, you state that "the method of producing a reverse negative by reversing the position of the plate in the dark slide is well known and has been much adopted, but there has always been dissatisfaction expressed with it on account of the differences found in the thickness of the glasses upon which the negatives are to be taken."

This is a difficulty easily overcome by having a special focussing-screen to suit the reversing slide (which is a very inexpensive affair). It will not matter, then, how much the plates vary in thickness, neither will any calculation be required in racking the lens in and out to get a proper focus.

I send you a camera and slide for inspection which I arranged for the reversing of negatives nearly twenty years ago.—I am, yours, &c.,

26, *Calthorpe-street, Gray's Inn-road,* George Hare.
London, July 30, 1877.

WORKING-UP AUTOTYPES.

To the Editors.

Gentlemen,—I have pleasure in replying to the query of "H. R. H." (Aberdeen) in your last issue.

The greasiness on carbon prints, which renders it so difficult to work upon them, is entirely removed by rubbing them gently with a tuft of cotton wool previously soaked in a weak solution of liquid ammonia in water, three or four drops to the ounce.—I am, yours, &c.,

Bell-street, Wakefield, July 30, 1877. T. C. H.

PHOTOGRAPHING ON ENCAUSTIC TILES.

To the Editors.

Gentlemen,—Observing in your Journal of this week a letter on the above subject, and having for many years made ceramic photography an especial study, it occurs to me that I may have the very thing your correspondent "A. W. E." is asking for. If so, I shall be pleased to give him a tile with a very pretty subject faintly etched and fired, ready for full colouring by hand, accompanied also with a print to assist in the painting.

I have some exquisite things thus done. I believe I have three or four I can spare. If any other of your readers are interested in this beautiful and, to my mind, most fascinating of all the branches of photography, I will gladly give these spare tiles as far as they go.—I am, yours, &c., Henry N. White

Woodside, Wootton, Isle of Wight, (*Amateur*).
July 28, 1877.

Miscellanea.

Photographic Statistics.—At the last session of the Berlin Photographic Society a report was presented on the extent of photography in Germany, from we which we glean some interesting statistics. In the German Empire there are 3,000 photographers, who require each on an average three pounds of nitrate of silver annually. Austria possesses the same number of photographers, but the average annual consumption of nitrate of silver is but one pound. Germany manufactures 20,000 reams of albumenised paper annually, of which but 1,000 are for home use. 40,000,000 *cartes-de-visite* were prepared in Germany during 1876.—*Nature.*

Large Telescopes.—From the *Scientific American* we learn that Messrs. Clark and Son, of Cambridge, Mass., are making a telescope fiteen feet long, with an object-glass of eleven inches in diameter, for the Government Observatory at Lisbon, to cost $6,000, and be used for photographing the sun. Princeton College is having a $4,000 one made with a nine-inch glass for astronomical excursions, and talks of getting a much larger one. The Clarks are also to make a gigantic one for Yale College, but it will take several years' work, and cost some $50,000; the flint for the object-glass, which has already been bought in France, cost $6,000.

Photography and the Reproduction of Documents.—The usefulness of photography as a means of reproducing documents is only now, as it seems, beginning to be generally recognised, although it is six years and a-half since its capabilities in this way were illustrated by a striking example. Every one remembers how the French government at Tours caused the advertisements in an English newspaper to be photographed in miniature and transmitted by pigeon to Paris, where they were again reproduced in something like their original size and exhibited to the besieged inhabitants, to whom so many of them were addressed. But the advantages which in time of peace might be derived from photography had not until this year made themselves at all clear to the public mind. In February last the French government at length took the matter up, and appointed a committee "to inquire into the best means of reproducing by photography the documents preserved in the State collections." The report of the committee has now appeared, and it contains recommendations which obviously deserve the notice of other governments besides the French. The principal advantages to be gained by allowing a reproduction of the documents in question are three in number:—It will enable the directors of libraries or museums to lend copies of rare works they possess, and if necessary to save the originals from being worn out or defaced by too frequent use, by substituting *facsimiles* of them for all ordinary purposes. It will, in case of fire or other accident, guarantee at least the probable preservation of accurate and absolutely correct copies of a lost work. The committee recommends that, subject to proper precautions, all qualified photographers should be allowed to take copies of such works as they please on condition of conforming to strict rules as to their method of working, and of depositing a negative with the State official, who is to be permitted to use it at his discretion for national purposes.—*Dublin Evening Mail.*

Photography in Court: *An Actress and her Photographer again.*—At the Bloomsbury County Court the case of Bonell *v.* Hayes was heard before Mr. Judge Russell, in which the plaintiff, a photographer carrying on business in Euston-road, sued the defendant, an actress at present engaged at the Park Theatre, to recover the sum of £5 for a dozen photolithographs, ordered by the defendant at an agreed price, and which had been forwarded to the defendant's residence, Gloucester-road. She never complained, either of the price charged or of their execution, until the account was pressed for and the present action was commenced. The order for and the delivery of the goods having been proved by the plaintiff's assistant, Mr. M. Lewis, who appeared as solicitor for the defendant, said he had a good defence to the action on its merits, and, further, he would prove that the lady in question was married, and was sued against under her stage name instead of her husband's, who was the legal defendant in the action. The judge overruled the plea of coverture, as notice of it had not been given within the time specified by the Act of Parliament. When upon the merits of the case, it was stated that defendant's likenesses were not at all faithful ones, and if exhibited—which was intended in the first instance—would do the defendant more harm than good. In reply to the Judge as to why, such being the case, they were not returned at once, instead of being kept nine months, Mr. Lewis said the defendant had been in the provinces, upon which, without calling on the defendant, the Judge gave judgment in favour of the plaintiff for the full amount claimed, with costs. ——*Charge of Selling Indecent Photographs.*—At Worship-street Police Court, on Wednesday last, the 1st inst., Martha Abrams, 55, and Peretz Abrams, her son, 15 years of age, were charged before Mr. Barstow with selling indecent prints and having indecent prints in their possession. It appeared from the evidence of detective-serjeant Tew and detective Vincent, H Division, that on the previous night the prisoners were in the City-road with a stall, on which were spread a number of photographs, *cartes-de-visite*, &c., for sale. Some information had been previously given to the officers that the prisoners offered privately the photographs to men. The officers made one or two purchases, and then asked the boy if he had anything else to show them, and he, going to a corner of the stall, beckoned them to him, and then produced a quantity of obscene prints, and sold them to the officers at 2d. each. The boy and woman were then taken into custody. The magistrate examined the photographs, of which a great number were produced by the officers. There were certain productions of a French character, principally caricatures, but the majority of the photographs were copies of well-known works of art—*Leda and the Swan*, *Perseus and Andromeda*, *The Greek Slave*, &c. Mr. Barstow was of opinion that the works were indecent within the meaning of the Act, and ordered them to be destroyed. He fined the woman forty shillings, or one month, and discharged the boy, believing that he had acted under his parent's direction.

EXCHANGE COLUMN.

A 4A Ross's portrait lens will be exchanged for a Dallmeyer's 6D and pair of stereo. lenses.—Address, C. P. Gee, Weymouth.

In exchange, for a half-plate portable bellows camera, an exterior background painted by Bull, London.—Address, George Bannerman, City-buildings, Corporation-street, Manchester.

Wanted, a pair of stereoscopic lenses, short focus, in exchange for a landscape lens by Lerebours and Secretan, 20-inches focus 3¼-inches diameter.—Address, T. C., 56, Clayton-street, Hulme, Manchester.

I have a 15 × 21 folding camera with single and double dark slides. Will take in exchange a good long curtain for the background.—Address, Artist, Roman Mount, Lancashire Hill, Stockport, Cheshire.

A very good head and body rest, all motions, four brass screws, will be given in exchange for a water-tight glass and mahogany bath in good condition, not less than 8½ × 6½.—Address, T. G. F., Maker Heights, Devonport.

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ANSWERS TO CORRESPONDENTS.

Photographs Registered—

W. Usherwood, Dorking.—*Photograph of St. Martin's Church, Dorking.*

John Owen, Newtown, North Wales.—*Two Portraits of "Mynyddog," the Welsh Bard.*

Richard Dighton, Cheltenham.—*Three Portraits of W. Nash Skillecorne, Esq., Mayor of Cheltenham.*

☞ *Correspondents should never write on both sides of the paper.*

Maxwell Jackson.—Received. In our next.

Thomas.—We shall try the paper when we next print.

Hugh Owen (Barmouth).—The matter shall receive attention.

Geo. M'Dougall (Montreal).—Yours, with enclosure, received. Thanks.

W. U. (Dorking).—A registered photograph may be printed in any dimensions without the necessity of registering each size.

Devoniensis.—We are at variance with you in the statement that Scotch glue is purer than refined gelatine. Such is not the case.

H. Jourdin.—Detailed information respecting the method of detaching films from glass will be found in an article on *Single Transfer* in the present number.

J. McLachlan.—We believe that if there be any difference the balance of advantages will be found to be in favour of the press having two rollers. But the *effect* produced will be the same in both cases.

J. F. Jones.—It is eight years since we last heard of the person who is the object of your inquiry. If we are correctly informed he judged it prudent to make a very sudden and secret exodus from this country.

A Professional.—It is quite possible to print opalotypes having a tone as fine as, if not finer than, can be obtained by mercury, and which shall be durable. But we advise you not to continue in the practice of printing pictures on opal by means of silver, but, instead, to adopt carbon.

E. A. S.—Unless you are prepared to adapt an extension to the camera there is no lens now being made by which you can obtain an image of the dimensions indicated. You must procure, or have made, an objective of the orthoscopic form, in which the optical centre is outside of the front lens.

J. Ekralc.—So far from being new, the process you describe is precisely similar to one for which a patent was applied for by Mr. F. R. Wells exactly twelve years ago. Consult the records of the patent office of that period, and we believe you will then decide not to proceed farther in your effort to obtain protection.

Semper Vigilans.—A bath so weak as that which you have been using will never fix prints properly. Make one that contains a much larger proportion of hyposulphite of soda—say six or seven ounces to the pint of water—and allow the print to remain in this solution for ten minutes. If this recommendation be adopted you will be no longer troubled with stained and faded prints.

Old Subscriber.—The proposed plan for the glass-house is most excellent, with one exception, viz., the roof does not possess sufficient slope. It is true that this will not make any difference in the transmission of light, but it will prove an evil of serious magnitude during a fall of snow. For this reason we recommend that a more extreme pitch be given to the roof, which in this case can very easily be done.

R. S.—1. The last time we obtained such markings, we found them to arise from the collodion having been too horny and too heavily iodised. By the addition of one or two drops of water per ounce, coupled with the strengthening of the silver bath, the markings were got rid of.—2. We cannot hazard an opinion regarding the nature of the white powder. Protosulphate of iron is not always obtained in a state of absolute purity, being frequently contaminated with the sulphates of zinc, magnesia, lime, &c.

C. H. E.—1. A skeleton cube, such as that described, may be photographed by almost any description of lens the focus of which is of sufficient length—say of about twenty inches solar focus. A lens of this kind would have a conjugate focus of about forty inches when employed in producing a negative image the same size as that of the original object. The requisite depth of defining power could only be imparted by reducing the aperture. It is probable that a landscape lens with a stop of a quarter of an inch will answer your purpose in an effective manner.—2. Select a formula from our Almanac; and in respect of the item of "water" substitute drachms for ounces. This will give a concentrated solution which will at any time be fit for use upon the requisite quantity of water (seven drachms) being added to each portion containing a drachm of the solvent. An equally good way will be to make a *saturated* solution of protosulphate of iron, and ascertain by means of one or two trials what degree of dilution is necessary in order to best suit your requirement.

F. Crawford.—Make a tight-fitting cover of calico for the collodion bottle, and place the bottle thus protected in such proximity to water as will ensure the cover being kept wet. Now expose it to the sun or to a strong current of air, and the rapid evaporation of the moisture will cool the collodion down to such a degree as will render it easy to be worked with. It may also be desirable that the glass plates, after having been cleaned, should be transferred to a metallic plate-box, which is kept cool by the adoption of an expedient of a nature similar to that described. We presume that you have plenty of "freezing mixtures" in Persia, and imagine that some of them might be employed with advantage in keeping the bath and chemicals at a proper degree of temperature.

Edgar E. Wigglesworth.—The cause of the transparent spots in washed emulsions does not appear at present to have been ascertained with certainty. If you turn to an editorial article published in this Journal about a year since, and entitled *In Search of a Nucleus*, you will find that we made an attempt to run this evil to earth without, however, achieving the success we so much desired. Filtration through a close-grained fabric, a short time before use, alleviates the evil, although it is by no means a cure. The views enclosed will prove delightful little reminders of what must have been a pleasant tour. In case any reader may be in a position to throw light upon this obscure subject we append an extract from the letter of your correspondent:—"I have just returned from a holiday tour. Previous to going I prepared some five or six dozen dry emulsion plates, and whilst away exposed two dozen. On development the whole were found to be simply ruined by transparent spots, such as are described by Mr. Magar in your issue of the 13th instant. I am afraid all the rest are infected with the same complaint. I shall be sincerely thankful if you can recommend any remedy, as the plates are 7 × 5, and I do not wish to lose them. What astonishes me most is that I made some two dozen quarter-plates from the same batch of emulsion a week previous to my trip, and they produced excellent pictures."

Moist Collodio-Bromide in Excelsis.—In a note we have received from Mr. William Brooks that gentleman gives us a graphic account of a successful effort he has made in photographing under circumstances replete with difficulty. Mr. Brooks says:—"I have just been doing a very difficult subject—one of the most difficult. It was a crypt down in Sussex. I will give you a description of it. The principal light came from the west through a window about five feet square, and that was whitewashed over. It had a small swing window in it for the purposes of ventilation, and that was all the direct light that I had—not much, you will say; and at the eastern end there were two windows about eighteen inches wide and three feet high, also whitewashed. The place is built of stone of a yellow colour. I went down one day to look at the place, and then went home to think about the task to be undertaken. It was very important that it should be done; so do it I must. An ordinary wet plate was out of the question, and a dry plate would be too slow. I set to work and carefully prepared a moist emulsion plate by a formula of my own. I prepared the plate over night about six o'clock, and went down the next morning and exposed it. I took my 9 × 7 camera. The space was so confined that all I could use was a symmetrical lens four inches focus (it nearly covered the 9 × 7 plate). It was with very great difficulty I could see to focus. I exposed the plate for two hours and forty minutes, took it home, and developed the plate next morning. The plate had then been prepared forty-two hours; but I developed a most perfect negative, without any blurring whatever and fully exposed—if anything a little over-exposed—the detail all up in the roof being very perfect. That speaks well for emulsion! I have come to this conclusion—that it is now quite possible to photograph subjects that have hitherto been thought impossible on account of weak light. I forgot to mention the plate I used. I estimated its rapidity at about three times more than an ordinary wet plate prepared with nitrate bath and everything in good, fair condition. I thought you would like to hear of my success in this direction, so have sent you these few lines."

Received.—Rouch's *New Illustrated Catalogue; Street Life in London; Dublin University Magazine* for August. These will be noticed in our next.

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West Riding of Yorkshire Photographic Society.—The committee have decided that the next excursion of this Society shall be on Wednesday next, the 8th instant, to Roundhay Park, Leeds. After having inspected the park the party will return to Wharton's Hotel, Leeds, for tea. It is confidently expected that the visit to the park will be most enjoyable.

South London Photographic Society.—The annual outdoor meeting will take place tomorrow (Saturday), the 4th inst., at Hampton Court. After photographing during the day the members and friends will assemble at the Mitre Hotel at six o'clock, to partake of tea, and to spend a few hours together. On Saturday July 21st, many of the members assembled at the house of the President, the Rev. F. F. Statham, M.A., to enjoy the liberal hospitality which he annually invites them to partake of, a very pleasant and social evening being the result.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 901. Vol. XXIV.—AUGUST 10, 1877.

SINGLE TRANSFER.

In Three Chapters.—Chapter III.

Having cleared the way by treating, in as exhaustive a manner as our space warranted, the various methods by which reversed negatives may be either taken or prepared for carbon printing by single transfer, we now arrive at the printing process itself. But at this stage it may be as well to dispose of a question which has several times been put to us in the course of the few days that have elapsed since this short series of articles was commenced, namely—Is it possible to obtain carbon prints of as high a class by means of single transfer as if the process by double transfer were employed?

Bearing in mind the many exquisite specimens of "chromotypes" which have from time to time during the past two years been submitted to us, and which are quite as fine as anything we have seen executed on albumenised paper (the highest praise that can be given), we are, notwithstanding, compelled to assert that neither in theory nor in practice can the double transfer be held to be superior to the single method. On the other hand, however, we are not able to homologate certain statements made to us to the effect that by single transfer prints can be obtained of a quality far surpassing that possible to be got by the double method. Into the details of any comparative examination we shall not here enter; it is sufficient for the tyro, for whom these chapters are intended, to know that results of an exceedingly fine character can be obtained by the process which we are now describing, and that if he meet with any works executed by other methods which are finer than his own, to the man, and not the method, is the fault attributable.

The carbon print having been removed from the printing-frame is ready for development, and it is at this stage that the "two ways" of further procedure present themselves. Our choice confining us to the advocacy of single transfer, we immerge the pigmented paper in water for a few moments, at the same time also immersing in water the paper upon which the paper is ultimately to be attached. These two are then pressed into intimate contact by means of the "squeegee"—a slip of india-rubber set into a rigid slip of wood. Here we leave the two papers to become wholly or partially dry, while we refer to the nature of the paper to which the picture is being attached.

A sheet of common wove writing-paper will answer, in a sort of way, for this purpose; but not at all well, because it is not properly sized. If we are to imitate a delicate albumenised surface we must use a paper which has a surface of that character. Some have complained that pictures by single transfer have a dull, lack-lustre appearance; but how could it possibly be otherwise when, as we found upon investigation, the prints were usually developed upon a paper almost as porous and devoid of lustre as ordinary white blotting-paper? Here is a simple experiment that any person may try, and which will show how much depends upon the nature of the surface upon which the print is developed:—Procure two plates of opal glass—one of them flashed and polished, the other being pot metal and having its surface ground. Now develope upon these plates two carbon pictures which have been treated alike in every respect, and when both pictures have been finished and dried note the great difference existing between the two. One appears to be on the surface, and has a certain kind of sparkle about it; the other has a soft and sunk-in appearance, arising from optical conditions which we need not here discuss. Now, if such diverse appearances can be produced when developing upon two descriptions of plates so nearly allied in character as flashed opal and pot-metal opal—the surface of the one being polished and the other left grey—how great must be the influence produced by the particular kind of paper, or rather the surface of the paper, upon which the carbon print is developed!

We have said that carbon prints may be developed upon plain wove writing-paper. Very numerous are the prints we have developed upon such material; but it is very far from being the best for the purpose. With this observation we now plunge *in medias res.*

On the character of the surface of the paper upon which carbon prints are developed wholly depend their value. Let it be understood that we are not here speaking of enlargements, or even of small pictures intended to be framed, but of carbon prints unsurpassable as respects their finish—such pictures, for example, as small portraits of *carte* or cabinet dimensions which, when examined, are held in the hand of the spectator to be subjected to critical introspection. In short, we are now speaking of pictures which have to compete with albumenised miniature prints of the very highest class.

Reasoning from analogy, and well aware that silver prints executed upon plain or absorbent paper are flat, sunk-in, and devoid of lustre, we must so adapt the surface of the paper upon which the carbon print is to be developed that it shall be kept upon the surface. Soon after Mr. Wood, of Edinburgh, published his method of coagulating the surface of albumenised paper by exposing the paper to hot steam, we tried paper prepared in that manner as a permanent support for carbon prints made by the process of single transfer, and found that the surface so obtained was one of the finest that could well be desired. The method proposed by Mr. Wood was to place the sheets of paper in a chamber to which was admitted steam of very high temperature, by which the albumen was coagulated and rendered insoluble. We may here remark, *en passant*, that failures in this operation will inevitably result if steam from a high-pressure boiler be employed, because, curious as it may seem to those unacquainted with the subject, the temperature of high-pressure steam is not by any means "high." Steam, however, is not necessary to impart insolubility to abumenised paper; immersion in boiling water for a few seconds will, we find, effect this end in a most perfect manner. If paper which has been subjected to this kind of treatment be sponged over with, or floated upon, a weak solution of gelatine to which a little chrome alum has been added, we have, as the result, a single transfer paper of the very finest description that can be desired, unless we except paper which has previously undergone the treatment known as "facing."

By some of our readers it may be remembered that, eight or ten years ago, we described the method of positive printing by means of the camera and collodionised films then practised in the establishment of MM. Disderi and Co., at Hereford-square, Brompton. The paper employed by Mr. Prætorious, on that occasion, was a thin sample which had been most beautifully "surfaced." We understand that it is a commercial preparation, and can be procured without much difficulty. A sample of this surfaced paper prepared so as to stand warm water, which we afterwards utilised in carbon printing, yielded us the finest carbon print we have seen hitherto. We here throw out a hint to those who may try "surfaced" or "enamelled" papers of the class to which we allude:—Sometimes, owing to certain kinds of metallic oxides present in these papers, they will acquire a powerful tone from the bichromate of potash in the pigmented tissue cemented to them. In many instances this may be prevented by the use of ammonia.

A plain paper coated with gelatine rendered insoluble by chrome alum seems to us to give an exquisite surface—indeed the most fastidious need desire nothing finer. Mr. J. G. Tunny informs us that by coating paper with plain collodion he obtains a surface at least as fine as, if not decidedly more brilliant than, that of the best albumenised paper to be met with at the present time. It is an undoubted fact that collodion will both prevent the pigmented image from sinking into the paper and impart to it a smooth surface. It is, however, pleasing to find that one need not necessarily have to prepare this description of paper, for a sample we have received from the Autotype Company is so fine that, in the ordinary practice of carbon printing by single transfer, we should much prefer to purchase it thus ready provided rather than undertake its preparation ourselves.

If paper that has been sized with gelatine and chrome alum be immersed in hot water it will become "slimy," and if a print be affixed to it while in that state the attachment will be so perfect that nothing will suffice to effect a separation. Let it be remembered that the property of chrome, or even ordinary, alum is to confer insolubility upon gelatine, and that paper which has received a coating of this compound never, even when immersed in hot water, becomes more than "slimy," in which state it adheres with very great tenacity to any carbon tissue with which it may be pressed in contact.

The exposed pigmented paper having been attached to the permanent support the combined papers are, after five or ten minutes, immersed in a vessel of warm water. The tissue is then stripped off, and the details of the image rendered visible by agitation with waves of the warm water.

If an intensely-glossy surface be desired the print must be "enamelled" by means of a film of gelatine and collodion, in the manner so well known to every photographer.

ON THE PHYSICAL PROPERTIES OF EMULSION FILMS.

The remarks of our contributor, Mr. H. B. Berkeley, in our last number, upon the *Physical Peculiarities of Emulsions,* open a question which has as yet been but little subjected to investigation, but which may be found to have an important bearing upon the theory of emulsions. We have made frequent allusion to the colour of emulsions by transmitted light as affecting their *working qualities* generally; but we do not remember until very recently to have had our attention called to the matter in connection with sensitiveness alone. A few weeks ago, however, in preparing a washed emulsion by M. Chardon's method, we were struck with the difference in colour of the finished emulsion when compared with any we had previously prepared by the same process, there being a very noticeable deficiency in the red tinge for which M. Chardon's process is remarkable.

We attributed this difference to some slight variation in the manipulatory details of preparation, as we were unable to mark any deviation from the formula we had previously used, nor had we employed any new material—the pyroxyline, bromides, ether, and alcohol being portions of the same stock with which previous experiments had been made. The only supposition was that we had scored a partial failure; for, placing implicit faith on the test of colour, we never doubted that the emulsion would be found inferior in quality.

The difference in colour was not sufficiently great to warrant us in supposing the emulsion would be entirely useless, but was such as previous experience had taught us gave a second-rate result. There was no approach to the green tint spoken of in connection with the albumen emulsion, but merely a diminution of the ruby shade we generally prefer. The film, while moist, was of an orange colour, with a tinge of brown, and was duller and less translucent than usual; when dried it became opaque, and the surface assumed a dead matt appearance. Now, whether the colour change was to be accounted for by an alteration in the state of division of the particles of bromide is a point which requires elucidation; but the other peculiarities—the want of transparency and the matt surface—certainly point in the direction of coarseness of the deposit, though the difference was not so great as to amount to visible granularity.

Upon testing the working of this emulsion we were surprised to find that not only was it not inferior in general qualities to the richer-coloured samples, but that it actually exhibited a considerably higher degree of sensitiveness than the latter, especially in the more feebly-lighted portions of the impression. The development was also more rapid and, at the same time, singularly clean, and density to the extent we are in the habit of expecting was easily obtained with alkaline pyro. alone. But silver intensification appeared to produce little further effect, and the image after fixing was found to be extremely thin and delicate, resembling more an iron-developed film than one in which pyro. had been employed. Subsequent trials proved that alkaline pyro. was equally incapable of producing intensity beyond a certain point, at which the film appeared to become exhausted, though after fixing the density was readily worked up by a renewed application of pyro. and silver.

Since reading Mr. Berkeley's article we have made one or two experiments with the emulsion, with a view of testing the nature of the developed image. First of all a film was developed to the full strength obtainable with alkaline pyro., fixed, and treated with chloride of copper and again developed with alkaline pyro. The result was that little gain in density was noticeable, showing that the thinness was not due to any peculiar arrangement of the atom of bromide, while the appearance of the bleached image was sufficiently conclusive that it was attributable to deficiency of silver. A second film developed to about the same strength for comparison, using a richer-coloured emulsion and treated throughout in a similar manner, yielded an image under the action of cupric chloride which gave evidence of the presence of a large proportion of metallic silver, and the gain in density, upon redevelopment, was also greater.

Another film, developed to the fullest strength obtainable, was treated with dilute nitric acid to remove the reduced silver; the result was that even in the highest lights but a small proportion of the bromide was found to have been reduced. The companion plate, prepared from a different emulsion but treated in the same way, gave perfectly clear glass in the high lights. This seems to prove a great deficiency in the reducing action of the developer upon the film composed of the coarser particles, and we have to consider how the difference arises.

It has been shown that, even in the finest state of division it is possible to secure, the bromide of silver exists in emulsions, not in single atoms or granules, but in masses composed of a greater or less number of individual particles adherent to one another. Such at least is the case so far as the microscope enables us to pursue the examination; beyond that it is impossible to speak. It suffices, however, for our purpose that this grouping of the individual particles exists in the emulsions we employ, and that what we are accustomed to treat as single atoms or granules in a state of varying fineness are, in reality, groups of infinitely smaller particles in a state of cohesion. For the sake of argument we will suppose the existence of a homogeneous film composed of ultimate atoms in an extremely fine state of division. Now, a ray of light traversing such a film would strike each individual particle in its passage, and the result would be, upon development, that the whole would be reduced. On the other hand, supposing the film to be composed of innumerable bunches of atoms, the light in its passage would strike only the exterior particles in each group, suffering deflection from group to group until it had passed out of the film. In this manner a portion of the individual atoms, being protected from the light's action, escape reduction by the developer, the result being the formation of a comparatively weak image.

In some such manner as this we may account for the difference in the behaviour of the two types of emulsion—at least so far as regards the power of giving density; and, though perhaps not theoretically correct, it agrees pretty closely with facts. But it makes no provision for the increase of sensitiveness which is observable with the coarser films, notably when prepared with a considerable excess of silver. It is difficult to give a rational explanation of this increased impressibility, but we may be allowed to suggest that it is possibly due to the mechanical "locking-up" amongst the agglomerated particles of bromide of a certain quantity of free nitrate, which, acting as an absorbent, seizes upon the bromine set free by the action of light, forming new silver bromide and neutralising its retardent action upon the subsequent development. This, however, is pure hypothesis, but we see no valid objection to its correctness; and we shall be pleased if those of our readers who devote their attention to this and kindred subjects will state their views on the question.

In conclusion: we may say that, though undoubtedly Mr. Berkeley is correct in his general statement that fineness of deposit in the emulsion conduces to density and the opposite to sensitiveness, such is not by any means the case invariably. Until the matter has undergone further investigation it is impossible to attempt any explanation of phenomenal exceptions to the rule; but, unless the conditions be entirely changed with the vehicle holding the bromide in suspension, we have a standing contradiction in gelatine emulsion, where the finest possible division is accompanied by exactly the opposite results, viz., sensitiveness and difficulty in obtaining density.

A NEW OPENING FOR PORTRAIT PHOTOGRAPHY.

We have lately received a suggestion for widening in a small proportion the sphere of photography, which, particularly during the present depression—complaints about which reach us from all sides—we think well worthy the attention of our readers, and if taken up by some enterprising photographer it would seem capable of yielding a good harvest. Those of our readers who are lovers of books and familiar with private libraries will have noticed the owner's name inside many a cover—not written but printed—and accompanied by the coat of arms or some fanciful device, the whole forming what is termed a "book-plate." The practice is almost universal, by large collectors of books, to place these book-plates in each work as they receive it, and in this way there must be used throughout the country some hundreds of thousands every year.

The suggestion we make is that these plates, really and absolutely uninteresting of themselves, should be replaced by a photograph of the owner, arranged with or without heraldic devices and accompaniments, as might most adapt itself to the owner's taste, each successive owner adding his effigy side by side with its predecessor, whether from father to son or stranger to stranger.

We are of opinion that, properly taken up and worked out, the introduction and use of these portrait plates would lead to their becoming of permanent and increasing value. The enormous prices which in the open market and at auction sales some books attain to is often enhanced by some personal reminiscence attached to them. The signature of a famous man will always send up the price of a work; and such are the vicissitudes of books that it is exceptional for a large collection of them to remain together unscattered as their owners pass away. Many a book has a history of its own connected with the famous hands it has passd through; and if, instead of book-plates pasted upon book-plates, as the owners changed, it had been possible for portrait plates to have been added to portrait plates, side by side instead of superimposed, they would be almost priceless. Let this be done at the present day, now that facilities exist for ensuring unerringly-faithful likenesses, and in a few generations hence our books will become treasure stores of inestimable value. History will be written in the covers of books, and many will be the instance where, when the inside has lost its value, the cover, hitherto valuable only so far as the binder's art has been called into play, will become a cherished possession.

For the full fruition of the idea it would have to be taken in hand either by an enterprising publisher or photographer, or, what seems to us the more suitable way, it should be brought before the notice of the Archeological and Antiquarian Societies by some one whose name would carry weight. That the idea is a good one we are assured; that it is feasible is self-evident; that it will be carried out with commercial success depends entirely upon the method of its introduction. It would be necessary to devise a few examples of the proposed innovation, and thoroughly work out the practical details of production and cost, as, the portrait plate being an entire novelty, it is not likely that proposed purchasers would enter into the matter unless it were put before them very plainly.

It becomes a question what style and size the portrait itself should be. Our idea is that it should be kept as small as possible to be consistent with excellence of photography and the details of the portrait being readily seen. A bust picture would allow of the greatest number of portraits being placed upon a single page; but there would then be a double loss—of the portrait of the figure and of details of costume, which, as time passed on, would be a great element of interest. This, however, might be left to individual fancy; exact uniformity of style is not a necessary element of the scheme, though it would be highly advisable at the outset to initiate an exact uniformity in the external dimensions of the plate in order that successive additions to the library gallery, as it might be termed, would present an appearance of regularity.

With regard to the method of printing, silver is entirely out of the question. Silver prints might stand without fading, but they are very unlikely to do so; and no element of uncertainty should be permitted, or the whole proposal would be damned. Some method of carbon printing, in pigments specially selected for absolute and not relative permanency, might be adopted, and with the advice of the Autotype Company this could easily be done; or a method of mechanical printing in printers' ink might, perhaps, be chosen from its permanency being beyond reach of doubt, and also from such pictures being producible at a much lower rate. It is evident that, if the suggestion be taken up, the question of cost at first would largely influence book holders, for at once it would become a question of thousands of portraits in many cases, and always of hundreds, as few book buyers of standing and social or literary position confine their collection to a few volumes; and, indeed, it is not with regard to minor collections that the innovation is proposed.

We have done our share in making public the suggestion, and it remains now with those interested commercially or otherwise—the photographer and the antiquary—to decide whether it is to be a success.

ON A NEW SYSTEM OF LIGHTING THE SITTER.

We have received from Mr. D. H. Cussons, of Southport, a descriptive circular dealing with the subject of lighting the sitter in the studio, chiefly with a view of explaining the uses of screens and reflectors for regulating the light, as recommended by M. Klary, of Algiers. Mr. Cussons has for some time, we believe, been a manufacturer of these useful adjuncts to the studio; and whether or not M. Klary is the originator of the system, it is certain that both screens and reflectors have been used in many of the best studios in this country for a considerable period. We extract the following from Mr. Cussons' circular, which contains in a condensed form the pith of the large publication issued by M. Klary, the latter being presumed to be the interlocutor:—

> I lay down as a primordial principle that the art of managing the light is of paramount importance. The study of lighting is more intricate than that of posing, but in the posture and the lighting of his model a photographer proves himself an artist instead of a machine.
>
> Light and shade giving us all our effects, our ability consists in using both in such proportions that we obtain at will the most varied effects. The top and side lights together are generally adopted in the construction of photographic studios; but it is in the injudicious use of the latter, especially when employed in too great a quantity, that many fine effects are lost, and the resulting picture is rendered flat and feeble, the natural shades of the face destroyed, the features distorted, the eyes, the mouth, the upper lip especially, shorn of their full expression, and the whole face wanting in graceful and natural relief. For heads

and half-length portraits it is quite unnecessary to use the side light in so large a quantity as is usual; the top light when under judicious control will give the better and more artistic effects of light and shade. In order to be really useful a side light must be taken on a level with or above the horizon; the best light is one which falls on the sitter at an angle of 45°.

It is necessary that the light be balanced in accurate proportion, the time of exposure sufficient to set forth the lighting, and the development adjusted according to the exposure. The lighting of the face should be balanced in such a way that the contrast may not be simply *black* and *white*, but a soft gradation of all the intermediate tones, as well in the lights as in the shadows, so as to produce a graceful and artistic picture. There are no pure whites to be depicted in the human face, though there are some portions which may be nearly so. The whole face should be more or less shaded, and some luminous touches be slightly thrown on the most prominent parts. The greatest distance from the eye of the beholder should be darkest in tone, the nearest portion the lightest, and every gradation between.

Of the three lights used in the studio the *diffused* may be employed in the greatest quantity, the *reflected* must be more restrained, and the *direct* used more sparingly and judiciously. The position of the sitter should be *under* the principal or strongest light. It is best to employ a soft and slightly-diffused light combining in due proportions the top and side. This is readily obtained by use of the head-screen (which being constructed with various movements will enable the operator to have this light under perfect control). It should be placed by the side of the sitter nearest to the light, and of course outside the focus of the desired picture. It must be elevated above the head, and raised or lowered and turned to the required angle until the operator observes the true and best effect upon the shades and lines of the face. There will now be seen a generally-diffused light over the whole of the figure, but a little predominent on the side nearest the light; then open a small accidental side light quite in front of the sitter, which will fall upon the prominent parts of the face. If the eyes are sunk deeply, lower the screen a little and move it slightly towards the shaded side of the face; it will thus increase the top light and bring the face into bold relief. The shaded side, though slightly darker than the other, will remain soft and full of detail.

Observe that the reflex of the eyes must be the same in each; these luminous points have their place on the upper part of the eye and nearest the side light—not in the middle. If the reflex appear in one eye only the face is too far away from the side light. Then move your camera and turn the face towards the side light until these luminous points appear on both eyes; the head will then be well lighted and the classic outline of the nose well rendered. A beautiful and often unforeseen lighting will be discovered by the movements of this screen. Being made of translucent material it softens, filters, and slightly diffuses the light over the head of the sitter, and is an immense power in the hands of a skilful operator for obtaining in any studio those fine effects of light and shade which produce a perfect picture, and which could not be easily produced by any existing arrangements of blinds or curtains. With taste and a little practice its use will become intuitive.

It is necessary to soften the edges of the shadows, in case of need, with a pure and delicate reflected light. This is done very readily by means of the concave reflector, used in accordance with the judgment of the operator. It should be turned towards the sitter in such a manner as to throw a concentrated light upon that part of the face under and behind the eye, as well as the darker portions of the neck, and you will thus avoid the spot of reflected light appearing in the eye. A perfectly exact position of the reflector is as essential as for the head-screen, in order that the proper balance of lighting may be obtained.

For lighting *à la* Rembrandt do not change the position of the face, but move your camera so as to obtain a view of the other cheek, and with some slight modifications of the head-screen this lighting will be as perfectly rendered as the other. It is not here necessary to use the reflector; the head-screen alone will regulate the top light, which must be used sparingly, so that it does not fall upon the points where the middle tones are wanted.

It is desirable in all studios to provide some object upon which the eyes of the sitter may be directed, and rest easily, at the point of vision selected by the operator; for this purpose we make a small stand upon which is mounted an object to be raised or lowered at will, and fixed at any given point. The semi-circular or alcove background of M. Adam-Salomon will prove a most valuable adjunct in a studio sufficiently large to admit of its free use, for by it we obtain the true effects of light and shadow in proper contrast with those of the figure; and hence the subject is brought out in bolder relief than it would be with a plain flat background. But in ordinary rooms, where the space is so restricted that an alcove background could not be advantageously used, we should recommend a flat background, graduated from top to bottom, from light to dark, and these, if artistically painted, will prove most effective and valuable.

The undoubted advantages to be derived from the use of screens and reflectors, under special circumstances, cannot be gainsaid; and it is to be hoped that Mr. Cussons' efforts may lead to their more general adoption.

ON A NEW METHOD OF PREPARING A WASHED EMULSION.

It seems almost an impossibility, considering the number of variations which have been introduced in the preparation of washed emulsions, to imagine a further deviation from the ordinary practice, or at least to devise a new means possessing any practical advantages; but, in spite of the difficulty, I purpose describing a modification in the process which, I venture to believe, will be found to possess very decided practical advantages. I have described it at the head of this article as "a *new* method;" but I must ask my readers to accept that term in a modified sense, for, strictly speaking, there is no new principle involved, but merely a rearrangement of the various steps in arriving at the end in view. At the same time I would have it understood that it is not a case of "ringing the changes" upon the possible variations in the process for the sole purpose of publishing "something new," but the result of carefully-conducted experiments made with an object, which object I believe I fully attain.

I may, perhaps, be allowed to explain the *rationale* of the method, or, rather, of the idea which led to the experiments. In doing so I shall have to glance briefly at the various changes which have taken place in emulsion processes, as well as their object and effect. Some years ago, before emulsions had been worked to such a pitch of excellence as they have now reached, the most rapid dry plates it was possible to obtain were those prepared by Major Russell's bromised collodion process; and it was at one time believed that the conditions which conduce to the high degree of sensitiveness in that process might be reproduced in emulsions. It is now generally agreed, however, that, though emulsion plates may be prepared possessing an equal degree of sensitiveness, the end is attained by the introduction of entirely different principles, and that it is virtually impossible to prepare an emulsion capable of giving a film identical in character with one prepared in the bath. An emulsion film *must* be uniform in composition throughout its whole thickness, while a bath film is not so, the surface bromide being formed in the presence of a large excess of nitrate, while the under portions retain a more or less considerable proportion of unaltered soluble bromide which it is almost impossible to remove.

The result of this state of things is that the bath film is extremely sensitive on the surface, and contains at the same time, locked up in its pores, sufficient soluble bromide to enable it to work clean and free from fog. Excess of silver in emulsion is equally conducive to sensitiveness; but, in order to render that sensitiveness available, it is necessary to resort to some means of restraining its fogging propensities either by the addition of a mineral acid or some organic substance. Unfortunately, however, emulsions made in this manner give density with difficulty, and the aim of the emulsion worker is to so combine the rapidity and density-giving properties as to secure the best compromise.

Turning to washed emulsions, the first intention was, by removing all soluble matter, to secure an emulsion capable of retaining its working qualities for a considerable time unimpaired, and requiring no subsequent treatment after pouring upon the plate. This was effected by pouring it in a thick layer into a dish, allowing it to set, and then treating it in all respects as an ordinary emulsion film, the dried product being finally re-emulsified. It was reasonable to expect that in this way the emulsion might be operated upon in bulk in such a manner as to give a result identical with that secured by treating the films individually. Practice has proved that such is not the case; for, setting aside the peculiarities in the preparation of certain emulsions, the general effect of the washing is to produce an entire change in the character of the resulting films. The emulsions which suffer this change to the greatest extent are those prepared with excess of silver, which, when treated in the manner alluded to above, though giving very rapid films, are sadly devoid of density.

To obviate this difficulty the method of treating the pellicle with an organifier in place of plain water was introduced, and subsequently of precipitating the emulsion by the addition of a similar organifier, instead of allowing it to set. These methods succeed well, and the latter proves a saving in time; but they are not economical, and it is questionable whether the action of the organifier in the presence of free silver does not introduce an element of uncertainty into the final emulsion.

Another plan which has been proposed, and which would seem to offer the best substitute for a bath plate, consists in treating the bromised collodion, previously poured out and allowed to set, with nitrate of silver; but here difficulties supervene which owe their origin to the altered physical conditions. The thick layer of collodion becomes superficially sensitised, and the formation of silver bromide on the surface locks up in the body of the layer a considerable quantity of soluble bromide which it is impossible either to convert or to remove by washing—the result, in the final emulsion, being a large excess of soluble bromide, and, *ergo*, insensitiveness.

This plan presents one great advantage—it does away with the trouble of sensitising and correcting the first emulsion, as well as effecting a saving of time. The one I am about to suggest offers the same advantage, and consists in a combination of two of the principles already mentioned, viz., the precipitation of bromised collodion by means of a solution of silver nitrate. By these means the collodion becomes intimately mixed with the sensitising solution, thus securing the conversion of the whole, or nearly so, of the soluble bromide, while, at the same time, the precipitate is subjected for a suitable length of time to any desired excess of silver. It may then, if required, be washed free of silver, and treated with an organifier without fear of forming any doubtful compounds. In this manner I hoped to secure a high degree of sensitiveness without a corresponding loss, with facility for obtaining density; and the results of my experiments so far are of a very encouraging character, though I have not yet sufficiently mastered the details of the modification to secure the highest effect I believe to be obtainable.

I find that in the presence of strong solution of silver there is no difficulty in securing an easily manageable precipitate, the silver apparently exercising some action upon the pyroxyline, which prevents its partial emulsification in the aqueous mixture, as frequently occurs. Another point worthy of notice is that the proportions of pyroxyline and bromide to solvents may be increased to a larger extent than is allowable when the emulsion has to be sensitised before precipitation; in fact, it is desirable that the solvents be reduced to the minimum, as we are thus enabled to employ economically a stronger silver solution. I find that an equal quantity of solution of silver is sufficient to precipitate a given bulk of collodion; and, as it is desirable to bring the collodion into contact with as strong a solution of silver as possible, that end is more easily attained by employing a collodion requiring thirty grains of silver to neutralise its bromide than if only half that quantity were necessary, unless, indeed, an extravagant excess of silver be used, which would afterwards require to be recovered from the waste solvents.

In a subsequent article I shall give the working formula, and shall be able to speak more definitely than I now can, in consequence of the length of this communication, on such points as the excess of silver it is necessary to use and the length of time it should be allowed to act upon the precipitate—both matters of the greatest importance; and I shall also be in a position to describe the effect of various organifiers after removal of the free silver. Meanwhile I leave the matter in the hands of my readers. W. B. Bolton.

BATH DEVELOPER FOR PORTRAITS.

Having had occasion to take some portraits of friends I made a bath of iron with which I obtained very good results, the mode of preparation of which I thought best to publish for the good of others interested.

In order to make the iron solution keep, and to prevent its becoming charged with acids, I did not add the acetic acid and alcohol until just before using.

My mode is as follows:—Make a saturated solution of protosulphate of iron (this salt is soluble in twice its weight of cold water); then to five and a-half drachms of this solution add—

Water (pure or rain)	3 ounces.
Acetic acid	3 drachms.
Alcohol (40 per cent.)	1½ ,,

The bath is then ready for use. The addition of a few drops of a five-per-cent. solution of acetate of soda gives results of a very high character. Flamment.

—*Le Moniteur de la Photographie.*

NOTES ON PASSING EVENTS.*

By a Peripatetic Photographer.

The "porotype" is a new process for copying engravings, and is based on the principle that porous paper when printed upon loses by the attachment of printers' greasy ink its porous character. We have thus a sheet porous in some portions and not so in others, and when this sheet is superposed upon paper prepared in a certain way, and backed up with certain other sheets prepared in other particular ways, gases are transmitted which react upon the chemically-prepared sheet upon which the picture is to be impressed, rendering the image visible. One thing suggests another. In a French periodical which I do not think is much seen by the readers of these *Notes*, and in a certain number of that periodical *(Comptes Rendus)*, issued exactly thirty years ago, the late M. Niepce de St. Victor published a discovery made by him, and which, if acted upon by the light of modern photographic knowledge, may lead to results of value in the world of art and applied science. M. Niepce found that iodine possesses the property of attaching itself to the blacks of an engraving, or of writings, to the exclusion of the whites. The engraving is to be submitted for about ten minutes to the action of the fumes of iodine, at a temperature similar to that which we in this country have been enjoying during so much of the present month as has elapsed. At the time this discovery was made photography was in too infantile a state to render its application of much utility; but we are now aware of numerous methods by which such a principle may be applied with advantage to reproductive processes. For example: the vapour of iodine is known to obliterate the effects of light upon certain sensitive surfaces; hence if such a sensitive surface were exposed to light for a period of time sufficient to ensure its developing quite black, or *white*—as the case may be—and an iodined engraving, drawing, or writing were superposed upon this surface for a few minutes previous to development, the resulting picture would be a *facsimile* in black and white of the original engraving or drawing. Further: as some of the initiated are aware, iodine when in contact with metallic plates of a certain kind modifies the surface in such a manner as to lead to the easy engraving of a plate thus treated. But I am advancing too rapidly. What M. Niepce actually did was to apply the iodined engraving to a sheet of paper sized with starch, taking care to moisten it previously with water very slightly acidulated with sulphuric acid. As every modern photographer knows, the iodine absorbed by the lines of the engraving will combine with the starch in the surface of the paper, forming in this way the iodide of starch—a substance which, we need scarcely observe, is of a very deep blue colour. Several impressions may be taken without the necessity for re-exposing the engraving to the fumes of the iodine. A film (upon glass) of albumen, gelatine, or collodion containing nitrate of silver may, by the mere contact of the engraving, have the image set-off upon its surface, and by subsequent exposure to light and development yield a perfect negative. But the applications of this little-known principle are too numerous to be treated in a discursive note like the present.

Of all the queer mixtures that have been imported into photography under the designation of "preservatives" I do not know of any so very queer as some of those recently proposed by M. Ernest Boivin, of whom it must be said that he is indefatigable in his experiments. Just fancy a compound composed of raisins and tobacco, or, worse still, a decoction of tobacco in "red wine of good quality!" But I must not criticise these mixtures in their new *rôle* of photographic chemicals or appliances, and this for the simple reason that I have not yet had an opportunity of trying them.

In an editorial article in a recent number, in which instructions are given in the use of washed collodion emulsion, there appears to be an omission of a very simple and good method for edging the films so that they shall not be able to start from or slip off the glass plates. I allude to the application of varnish instead of the filthy, but rather popular, tallow-candle edging. All the tallow that I have been able to procure leaves a nasty smear about the margin, which, while it undoubtedly protects the film, cannot be quite easily got rid of when it has done its work and the image is ready for varnishing. I have been trying of late a small and stiff camel's-hair pencil attached to the side of a light slip of wood, the arrangement being such that the wooden slip acts the part of a guard and prevents the brush from encroaching too far upon the margin of the film. For some time I was a little troubled as to securing the best way for charging the brush with varnish; but I have now cut the matter short by dipping the brush, guard and all, into the varnish bottle. I do not yet know the best description of varnish for this purpose, but I have been employing a thin alcoholic solution of sandarac with advantage. But, query: would not the sole drawback to the use of the tallow-candle edging disappear if something were melted with the tallow in consequence of which it would be rendered hard and less "rub-off-ative?" If any fellow-reader possess information in this direction, and will kindly throw out a hint or two, I for one will accept such with thanks, and I think I can say the same for a large body of dry-plate workers.

THE FILTRATION OF GELATINE.

Allow me to draw the attention of your readers to a simple plan of filtering gelatine and emulsion, in the hope that some one may be induced to manufacture the article wanted in glass, which is cleaner, and enables the photographer to see the operation.

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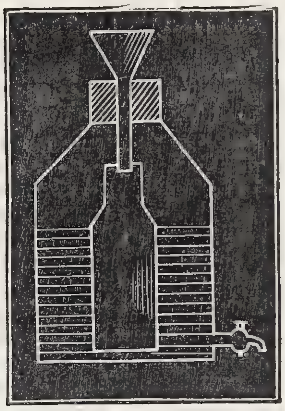
* Continued from page 368.

I have a tin canister about seven inches wide and twelve inches high, with a three-inch opening at the mouth and a half-inch waste-pipe let into the side, as near the bottom as possible. To use it: cork up the waste-pipe, half fill the canister with water, and lower it into the bottle which is intended to receive the filtered emulsion; then put the cork, through which is passed a funnel, into the mouth of the canister, dropping the tail of the funnel at the same time into the mouth of the bottle inside.



I prefer to filter through thick flannel, previously wetted with spirit. As I pour in the emulsion I draw out the cork of the waste pipe, and, as the water rushes out, the emulsion is forced through the filter.

I have not seen the ingenious machine of Messrs. Mawson and Swan, but my suggestion is, in the simplest possible way, to effect the filtration of viscous fluids. J. Maxwell Jackson.

P.S.—Instead of a cork at the waste-pipe a tap might be fixed, if preferred.

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NOTES ON OPAL GLASS AND PORCELAIN.

No. III.—*(Conclusion)*.

In my last *Notes* I expressed my preference for porcelain over opal glass; and it is a very decided preference, not only on account of the gain to the appearance of pictures produced upon it, but also by reason of its much greater strength. A very slight concussion is sufficient to shatter opal glass, while a tablet of porcelain might be thrown upon the floor without much risk of breakage. The tablets of porcelain formerly obtainable were of two kinds—the one highly glazed, with a surface like patent plate; and the other with a biscuit surface, which, though rougher than ground opal, was yet not porous.

In my own practice I used to prefer the latter, though it was less easy to work, from the tenacity with which the roughened surface took hold of the carbon, rendering it very difficult to clean. During the development of the carbon the bichromate stain was apt to fix itself also in a very troublesome manner. When put into the artist's hand it is also very trying to paint upon; and it is utterly useless to give a picture on biscuit porcelain to any artist who is not a thorough master of the brush, as every stroke tells, and has to remain when once made, there is no removing it practically. I now, however, find it, so far as I have inquired, impossible to obtain from the dealers any more of the biscuit porcelain. I adopted another form when my stock was exhausted, which happened to me at a most awkward time. I had half-a-dozen vignettes in mezzotint to do, and my stock fell short when only half were executed. The dealer who supplied me was also out of stock, and had to get more made at the works. I waited some time and was informed their manufacture had been discontinued, but that the "semi-porcelain" tablets could be easily supplied to me. This material, however, has a very second-rate appearance. It has none of the translucency of true porcelain, and the surface, instead of the beautiful purity of whiteness that so distinguishes the latter, has a clayey, opaque look that will not bear comparison for a moment with the genuine material.

My next step was to apply to the manufacturers direct. I put myself in communication with Messrs. Copeland, who, I knew, supplied the tablets for the firms I alluded to in the first number of my *Notes*, but they only manufactured the highly-glazed, and not any with either matt or biscuit surfaces.

As my readers may gather from what I have occasionally written that I always aim at permanency, especially in what I may call important and expensive works, I did not care to adopt the glazed porcelain, on account of the matt surface requiring to be produced by a varnish. The painting being executed upon this varnish, there must ultimately be discolouration of the whites and general degradation of tone, which would ruin a water-colour, though some yellowness is admissible in an oil painting. Thereupon I determined to get some porcelain, if possible, specially made with a surface with what might be called "egg-shell gloss."

Notwithstanding all my entreaties, an order for half-a-dozen 12 × 10 inch porcelain tablets was over three months in being executed. Every excuse was offered—strikes of workmen, spoiling of sundry batches of tablets, accidents, &c., &c.—till I was sick of the whole thing. Finally, however, the tablets did arrive, and out of the whole six only three were at all presentable, and they were decidedly "lumpy" on their surface. I, however, meanwhile proceeded to print my carbons on them and gave an order elsewhere for others, as I was determined to be able to work the thing perfectly.

I must now detail an experience with one of these plates. It appeared stained in patches when the carbon print was dry; but with some difficulty I got rid of the markings and gave it to my artist to paint in mezzotint. A month after it was finished the old stains reappeared, and, likewise, a fresh set over the face and other parts. This picture was thus rendered entirely useless, as the stains would not come out by gentle treatment, and were, besides, surrounded by water colour. Through a misapprehension, this picture, with stains and everything, was cleaned off by my printer, and I was precluded from ascertaining their origin, much to my annoyance, for I never met with such an experience before, and I do not like to permit anything of the sort to go by without discovering the cause. The last picture of the kind I had to do I printed on to a porcelain tablet which had been ground, or roughened, by the glass manufacturers by the same process as glass is subjected to. The surface was by no means so fine and even as glass; but in colour and translucency my preference was still by far in favour of the porcelain, and I am inclined to think that it is the material I shall ultimately adopt.

It might be thought that the highly-glazed surface could be roughened by etching, in the way the finest focussing glass is produced. Messrs. J. A. Forrest and Son kindly tried to do this for me, but they stated that the glaze would not give way in the slightest degree to the acid, though exposed far in excess of the usual time.

It remains to state whether this roughened surface is likely to give way to the action on sulphur, like the opal. The blowpipe showed it to contain lead, but in far smaller quantity than the opal glass. It did not discolour by the action of sulphuretted hydrogen water. I should, therefore, think it would be quite safe to employ the roughened porcelain, and that it would not discolour unless kept in a very foul atmosphere, and even then only after a very considerable lapse of time. G. Watmough Webster, F.C.S.

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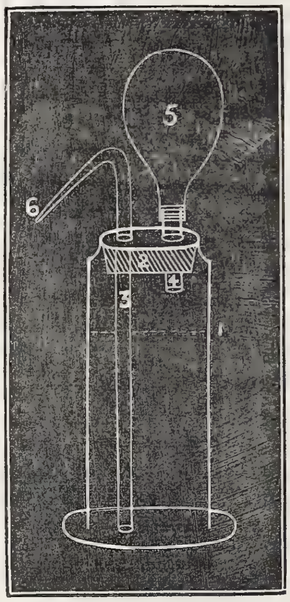
IMPROVED DROPPING-BOTTLE.

A good dropping-bottle has always been a desideratum in a laboratory, and especially among photographers for their silver intensifying solutions. As I have reason to be much satisfied with the one I employ daily I hope the readers of The British Journal of Photography will try it.



1, a heavy glass bottle. 2, the cork, through which two holes have been perforated, to allow the two glass tubes 3 and 4 to pass through. The cork is then waxed, to prevent the entrance or the exit of air. 5 is an india-rubber pear, upon pressing which (the solution being introduced) the liquid rises up the tube 3, and flows out at the point 6. Upon taking the hand off the india-rubber pear the air will rush into the bottle by the same point until an equilibrium is formed. The bottle is then ready for action again, and so on until all the liquid has been expelled from the bottle. It can be replenished by drawing off the india-rubber pear and pouring the solution into a small funnel—sufficiently small to enter into the glass tube 4.

E. Stebbing, *Prof.*

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FERROTYPES AND PHOTOGRAPHY UNDER PRESSURE.

Photography is certainly a creature of circumstances, and those who would derive from it the fullest possible advantages must indeed be men of varied resources. In a recent article I had occasion to notice the fact that, commercially, it was in a state of stagnation throughout the length and breadth of the northern portion of the country; and now I have just returned from a series of visits, extending over several hundreds of miles, where I have seen photographers not only busy, but working under a pressure hardly known in any other branch of industry.

I presume that in such a city as London, where there is an enormous daily influx of visitors, the addition on any particular occasion of a few thousands to the normal population will hardly, if at all, interfere with the even tenor of photographic life; and, in consequence of its vast size, it would be difficult for the trades, collectively, to take united action for the general suspension of work, except on Christmas Day and Good Friday. But, in smaller cities, such as even the largest north of the Tweed, the advent of half-a-dozen excursion trains more than quadruples the idle population; and, as the being photographed, especially when it can be done at a small outlay, is a favourite amusement, the photographer who would make hay while the sun shines must not let grass grow under his feet. Then if, in addition to the bustle thus produced, we consider that, year by year, it is becoming more and more common in those cities to arrange for the entire stoppage of the manufacturing industries, or "trades' holidays" as they are called, for a period of, perhaps, ten days, and that several cities may be enjoying a holiday at the same time, it will be evident that the resources of the photographer will be called upon to the fullest extent. Having had, therefore, an opportunity of seeing how, in many cases, such a press of business is managed, I now propose to extract a few jottings from my note-book of things to avoid or examples to follow.

The kind of trade to which I allude is essentially a cheap trade, the prices for *cartes de visite*, which is still the principal style, varying from four and sixpence to six shillings per dozen, and I may add that, as a rule, *the money is well worth the pictures*. A brief description of one establishment, while hardly a type of all, will serve to give a general idea of how things are managed.

The reception-room contained over thirty people, with dresses varying from the clean moleskin of the workman to that of a well-to-do U. P. minister, and from the modest print of the maid of all work to the overdone showy silk of an ambitious shop girl. From the incessant moving about and handling of everything portable, the scene had more the appearance of an approaching sale by auction than anything else. Seeing such a crowd, I meant only to say "how do you do" to the proprietor, and call another day, but he urged me to go into the studio, as his customers were not particular, and he took care not to give them time to move. The dark room was occupied by two youths—one coating and sensitising, the other developing or, rather, simply bringing out the image and laying the plates in trays of water for future manipulation. Each sitter, or rather sitters—as they were very generally in pairs—paid the money on entering the studio, and without any attempt at posing or altering the light—"just chucked in," as another artist once said to me—were photographed just as they happened to sit. Each plate had a number scratched upon the back, and when the assistant handed the slide to the operator he gave him a piece of paper on which a corresponding number was printed. This was given to the sitter, and he was told to call on a given day, when the prints would be ready. On my expressing certain doubts as to the probability of such a number of prints being ready by the specified time, he, with a merry twinkle in his eye, replied—"Bless you! We don't never mean to have 'em then. We never prints them kind till they calls, and you would be surprised, you would, if you see so many as never calls at all—forgets, most likely, where they have been taken, or perhaps, that they have been taken at all. Drink, you see, does make us forget things at times!"

It is not likely, however, that there are many as fortunate as to hear no more about the cards so paid for, and I think it would suit all concerned much better if some style of picture that could be finished at once were adopted on such occasions. The ferrotype, long so popular in America, is just the kind of thing that would suit, if it could only be somewhat improved, so as to approach more nearly to the brilliant beauty of the now almost superseded positives on glass.

I am aware that many attempts have been, and are being, made to popularise the ferrotype; but till the dull grey appearance which they generally present is overcome they are not likely to be successful. That the fault does not lie in the method of operating in this country is evident from the fact that the illustrations so freely spread abroad in Trask's little book, the *Practical Ferrotyper*—which, presumably, are the best that can be produced in America—possess the same cold grey and flat appearance as in those taken here. Neither nitrate of iron as a developer nor the so-called alabastrine after-treatment, that give such brilliant results on glass plates, will improve ferrotypes; and, therefore, although at first sight one might suppose there should be little difference between the glass and the metal as a support, the effect is very materially different. I think a careful examination will show that the difference arises from the close contact between the, to a certain extent, transparent film even in the highest lights and the black or chocolate colour of the iron plate.

It will be remembered that the most brilliant positives were those on which the black substance was placed on the back of the plate, leaving the glass between it and the image. In this way the polished surface of the glass reflected back a portion of the light that passed through the film, whereas such rays are absorbed by the black of the iron plate, and the tone thereby lowered in proportion to the amount thus passed, or to the thinness of the image. If this be so it will be evident that a good thick collodion, pretty strongly iodised, would be better than the thin and weak preparation generally recommended, as the greater the density of the reduced image the less light will be transmitted.

But at best this will be but a slight improvement, and nothing short of the interposition between the film and the coloured plate of some reflecting surface of sufficient thickness will have the desired effect. How this is to be done is a different matter, as it must be cheap, and not interfere with the flexibility of the plate; but I may just throw out the hint that, possibly, a coating of some preparation of silica, about the thickness of a sheet of mica, which could be rendered insoluble without losing its transparency, might be found to answer the purpose.

Although ferrotypes have not become popular, nor are likely to be so till some improvement is effected, I find here and there a photographer who has been successful in creating a large trade in them. On one of these I called a few days, or rather evenings, ago. The light was almost gone. He had just called up the eighty-fourth ticket, and I saw him, as he called it, "knock off" the holder. His work is altogether confined to quarter-plate ferrotypes, for which the price is uniformly sixpence each, and threepence additional for each member of a group. The business is carried on by the photographer himself, with the aid of a girl who receives payment as the sitter enters the waiting-room, and who supplies in return a ticket bearing a number which is strictly in the order of entering. Number one is first sent to the studio, and as soon as he is taken number two is called, and so on to the end. Frequently, however, so great is the demand on Saturdays and half-holidays, the sitters have many hours to wait before their number is called; and many a penny and twopence is paid by the holders of high numbers for an exchange with those fortunate enough to have low ones. While talking over the matter with him he boasted that he never needed to take a sitter twice, and I could not help thinking, as I looked at the specimens lying about, that he was not likely to be troubled with a second visit.

But surely it is folly to reduce the prices to such a miserable figure. The eighty-four pictures taken on the day of my visit represented a very hard day's work, and the nett sum yielded was only forty-two shillings. Taking the cost of plate and material—which in this case includes a suitable envelope—at twopence, that leaves a profit of twenty-eight shillings and eight pence to cover rent, taxes, salary of his assistant, &c., &c; so that even if every day were a holiday he would not soon become wealthy. He, and such as he, would certainly be nearer the mark by doubling their prices, taking time to produce such pictures as would bring their customers back, and thus enjoying life in a more rational way than is possible for those who do so much dark-room work at such a high-pressure rate.

John Nicol, Ph.D.

NOTES FROM THE SOUTH OF FRANCE.

Returning from Spain I came through the Pyrenees. The railway only goes as far as Gerona; from thence one has to take the *diligence* to Perpignan. Seated in the narrow *coupé* and looking down upon six, generally galloping, mules, one is drawn through the romantic mountains and valleys of the Pyrenees, of which so much was heard during the last Carlist war. Besides the enjoyment of the beauties of nature which this mode of travelling permitted me to taste, I found it very convenient as affording me an opportunity of stopping at several towns in the South of France and inspecting the state of our "art-science" as practised there.

Gerona, the principal town in the Spanish province of Puerta de Alvarez, is situated upon some hilly ground between hills, and has a population of 15,000. The two photographers who vegetate here still work in the manner of those good old times when all the arrangement of the sitter thought necessary consisted in the photographer saying—"Come, sit down here, and look straight at the camera!" Neither there nor in the surrounding townlets is there any great scope for the photographer, nor is there much to be said of their productions.

But I was very much astonished, when at Perpignan, by the very mediocre photographs I saw exhibited. Perpignan, a town of 25,000 inhabitants, and which is a French frontier fort, lies on the flat at the bottom of a beautiful valley. From its quay there is a magnificent view of the Pyrenees, including the highest of its snow-bedecked hills—the Pic Canibu. On examining the photographs in the show-cases one involuntarily asks oneself whether the photographers of Perpignan have laid a wager as to which of them should be able to produce the worst results.

At Cette, a lively little seaport and trading town, the photographs are, apparently in consequence of the neighbourhood of Montpellier, with its 55,000 inhabitants, much better, though even there they do not rise much above mediocrity.

At Lyons I found the show-cases, which I had examined four months before, mostly filled with new pictures, and at No. 55, Rue de Bourbon, I saw an exhibition of such exceptionally-fine photographs that I immediately jotted down the name of the firm so as to mention it in these *Notes.* The establishment bears the full sounding name of "*Photographie Universelle,*" and the name of the proprietor is "Gris." Having done so, and returned to my inspection of the beautiful photographs, my eye fell upon the name of Fritz Luckhardt embossed on the mount, and I subsequently remarked that all the pictures had the same stamp. The whole collection, consisting of fifty-five pictures, cabinet and *carte-de-visite* sizes, emanated from the studio of Fritz Luckhardt at Vienna. The exhibition of specimen pictures not taken by the exhibitors is also unfortunately gaining ground amongst us, and is calculated to deceive the public. Thus, Léon Emschwiller, "Alsatien Photographer," seeks to draw attention to himself by exhibiting Braun's well-known picture *Weeping Alsace,* &c., &c. Bellingard, No. 6, Rue du Bourbon, showed better pictures produced in his own studio. They were very tasteful in their arrangement and prettily set out; but the cold blue tone in which they and almost all the photographs in Lyons are finished is disagreeable. Among the better photographers in Lyons were Terisse and Son, and Protonieré, Faud, Toquet and Son. In the art-galleries there were some beautiful photogravures by Goupil, some of those in M. Prestel's show-cases being particularly wonderful. Regarded as a photo-engraving the most beautiful picture was certainly *La Justice au bon Vieuxtemps,* by Cortazza. Near to that, to my great surprise, I found a German copperplate representing the *Römerberg at Frankfurt-au-Main on the Coronation Day of Leopold II.*

I ought not to forget to take this oportunity of warning any German photographers or artists who may be thinking of taking a situation abroad not to choose the south of France, as the embitterment against Germans is still very strong there, and makes itself felt even by the traveller. People who converse in quite a friendly manner in the *coupé* with a German keep aloof from him whenever they alight, or while waiting at a station, so that other people may not suspect them of associating with Germans. In the hotels they were willing to take us for English or Russians, and treated us with all politeness. But only let some Frenchman whose curiosity knows no rest question the traveller's honesty as to his nationality or descent, until he extracts the information that the latter is a German, and he will immediately be punished for his honesty by the long faces and monosyllabic conversation of his neighbours. An acquaintance of mine, who is in business in a town in the south of France, assures me that he only gets on because he is a Hanoverian, and is therefore pitied as having been "annexed by Prussia." —*Monatsblätter.* T. H. Voigt.

MY STUDIO.

Operator No. VI.

In bringing these imperfect sketches of my operators to a close, I have thought it good to put down some of my random experiences at various times in connection with photographic assistants generally.

I believe, as a class, they partake very much of the elements that are to be found in all trades. The man of keen perceptions and quick hands makes more money than the plodder, although the plodding man is often found to be the better of the two in daily work. He is certainly paid for his steady honesty rather than for any existing brilliancy he possesses; but the snail-like, steady pace—never looking either to the right nor to the left, but always moving forward—is frequently of more real service in business than the fitful flashes of a quicker mind and temperament which blazes and dulls alternately. The slow man you can always rely on—at his own pace, of course; but there is often a doubt of the smarter man not being up to time at his own average rate.

But to come more particularly to individual characteristics. All have met, I doubt not, the man who puts on his coat as the hour for closing strikes, no matter in what condition his place may be, or how much overwork has to be got through. The thing he is always most ready to do is to go away. If he be asked to stay because there is a push, in nine cases out of ten he is in possession of an appointment or a headache. If you complain about the way the place was left the previous night, he will reply:—"I did not know that you wanted me to stay late." But when you do prevail upon him to stay it is not much advantage, for the tendency of this spirit is to retard work, especially if more willing hands are employed at the same time.

Then there comes the man with an eternal grievance. From his employer to the wants-boy everybody is trying to get the better of him. If he be careless with his things, and they get mislaid, somebody has hid them just to put him about, being perfectly certain he left them in their proper place. He always gets twice the work to do of any one else of his own size and weight. He is always being imposed upon; and if he did not take good care of his governor and the other fellows about when they were trying to come over him, he would just be ground to death—that's about what he would be. But he's a sharp fellow, wise in his generation, and can take care of himself.

Yet he is not half so bad as the man who never puts his hand to anything unless he cannot help it. This man has laziness and eye-service as a birthright, and he sticks to them. As long as your eyes are on him he can work, and work well; but turn your back for a minute and the tool drops from his hand, and, heaving a sigh of relief, he works no more. One's presence has a very depressing influence on this subject; but the moment you leave him the depression is removed, and he feels happy.

The man who never moves out of the bit comes next. Never idle, ever working, yet making no headway, he is always in a muddle—morning, noon, and night. He never knew when it was otherwise. At the best, life to him is awfully mixed up, for he is never sure of anything; and really, as he looks round in bewilderment, one knows not whether he is not much more to be pitied than blamed.

But the man for my money is more rare, yet to be picked up now and then. It is he who throws aside self and self-interest and looks at everything as if it were his own—handles and uses the materials with the same care as if he had to meet the accounts and provide for them himself. He has a larger brain, and his education is of a broader cast, than his general fellow-workers. As a rule he makes more money, from the simple fact—though it may seem strange—that he makes self a secondary consideration when his employer's interests are concerned. But almost invariably the employer holds a man of this stamp as his first consideration; and thus, without looking for it, or "waiting on," the return for his attention to business comes as a natural consequence. He is always working, always doing his best; and his best is worth having—it is sure to be no slipshod thing. This is the stuff our best men are made of—the men amongst whom are to be found the managers and the governors of the future. Murray Russell.

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PHOTOGRAPHY IN COURT.

Alleged False Imprisonment and Malicious Prosecution.—*Crossland* v. *Whittaker and others.*—On Tuesday last, the 7th inst., at the Liverpool Assizes, before Mr. Justice Denman, an action was brought by George Crossland, a photographer carrying on business in Portland-street, Manchester, to recover damages for false imprisonment and malicious prosecution, the defendants being Henry Whittaker, mill-owner and manufacturer, Rochdale; Samuel Stevens, head constable of Rochdale; and Samuel Marshall, a detective inspector in the police force. Mr. Hopwood, Q.C., M.P., and Mr. Wharton were counsel for the plaintiff; Mr. Pope, Q.C., and Mr. Collins were for the defendant Whittaker; and Mr. C. Russell, Q.C., and Mr. Smith represented the other defendants. According to the case for the plaintiff, it appeared that he is in the habit of going about the country taking photographs of gentlemen's residences, and that in January last he had taken photographs of the residence of a gentleman named Clegg, who is a relative of the defendant Whittaker. Clegg introduced him to the notice of Whittaker, and on the 20th January he was commissioned by Whittaker to photograph his residence, and also his wife and family. Accordingly plaintiff and his assistant named James went to execute the commission and took the photographs, the negatives being approved by the defendant Whittaker. Whilst he was finishing the photographs James was paid by Mrs. Whittaker £5 on account of them. They left to go to Rochdale Station to proceed to Manchester, leaving the apparatus behind them, but before the train had left Whittaker came to the station and accused plaintiff of having obtained from Mrs. Whittaker money by false pretences. Not wishing to have a scene at the station, plaintiff returned the £5 to Whittaker, who gave him an order for several dozens of the photographs. The photographs were finished, and Mr. Whittaker was asked for payment. He said he did not like the pictures, but plaintiff told him he would call for payment on the following morning. On the 31st January plaintiff and his assistant went to Rochdale, James going to Whittaker's resident to ask for the amount due. When he got there the defendant Marshall apprehended him, and the plaintiff was shortly afterwards taken into custody, the charge being that of obtaining money by false pretences from Mrs. Whittaker. After their arrest—which was without a warrant, and, therefore, Mr. Hopwood continued, was illegal—plaintiff and James were taken to the police station, where the defendant Stevens was, who, after making some inquiries, motioned to Marshall to lock them up. They were taken to the cells and confined there until the 2nd February, when they were brought before the magistrates on the charge stated. There Chief-Constable Stevens stated the case, and after Mr. and Mrs. Whittaker had given evidence the magistrates dismissed both the plaintiff and his assistant. There was no justification pleaded on the part of the defendants, but it was stated by Mr. Whittaker that he had no act or part in the plaintiff being taken into custody, and that he knew nothing about his arrest until a police constable told him of it, and said he must come to the court and give evidence. As to the part the police took in the matter it was stated that all the chief constable did was to state the case before the magistrates; and it was also said that Marshall took no part in locking the plaintiff up, but that he was taken into custody by another officer on his own responsibility. The jury found for the plaintiff, awarding him £5 against each of the officers and 40s. against Whittaker. On the application of Mr. Pope his Lordship stayed execution until Wednesday morning, when Mr. Wharton made application that a certificate for costs be allowed to the plaintiff. His Lordship said that plaintiff had brought the imprisonment upon himself by his own conduct, but as the imprisonment was illegal without a warrant the jury had given him a verdict. Judgment would be entered for the plaintiff, but without costs.

Ranvier *v.* Vernon Heath.—At the Westminster County Court, on Friday, the 27th ult., this case was heard before Mr. Judge Bayley. The plaintiff, an artist, sued the defendant, the well-known photographer in Piccadilly, to recover the sum of £12 10s., alleged to be due for painting five scenic backgrounds to order. Mr. Merriman appeared for the plaintiff, and Mr. H. Taylor Roberts for the defendant. It was stated on behalf of the plaintiff that he painted the backgrounds to order. The defendant had engaged a new operator, Mr. Marius, who suggested that backgrounds would be required, and the defendant consequently ordered them. The plaintiff, through an interpreter, said that in May last he called on the defendant by his request, and was instructed to paint the backgrounds, the first order being given by Mr. Marius, and the second by the lady attendant. He delivered them on the 19th June and sent in the account, the work being done at an agreed price, which was very reasonable. When he applied for the amount he was told to call after the defendant had seen them. When Mr. Heath saw them he refused to pay the account, and hence the present action. In cross-examination the plaintiff said he was not asked to paint two first in order to test his ability. A letter was here put in. In this the plaintiff was requested to paint two backgrounds in eight days. A subsequent letter instructed him to take the backgrounds away, as they were perfectly useless, and would remain on the defendant's premises at the plaintiff's risk.—Mr. Jules Marius, photographer, said he had been engaged by the defendant as operator in May last, for a month on trial. He gave the order to the plaintiff, who asked £3 each backgroud, but the defendant would only pay £2 10s.—E. Chiarisoli said he knew the backgrounds had been kept by the defendant.—This being the plaintiff's case, Mr. Roberts considered that the statute of frauds prevented the plaintiff recovering, but he would resist the claim on its merits, as the work was mere rubbish, and no photographer of the high standing of the defendant could possibly use them.—Miss Swindon said she was defendant's manageress, and ordered two backgrounds in order to test the plaintiff's capability; they were to be sent home in eight days, which was not done. When sent in they were found to be out of perspective and utterly useless.—Mr. Vernon Heath, the defendant, said he was present when the backgrounds were delivered, and that was on the 18th instead of the 1st of June; but even then he would have taken them if he could possibly have used them.—Mr. Merriman here addressed the court on behalf of the plaintiff.—The Judge said the substantial defence was that the work was perfectly useless, and under these circumstances the defendant was not liable. Judgment entered accordingly, with costs of solicitor and witnesses.

Monte *v.* Waite.—This was an action brought by the plaintiff, a photographer, carrying on business in High-street, Camden Town, to recover from the defendant the sum of £4 odd for costs incurred in an action in March of last year, the facts of which have been fully reported in these columns. Mr. Marcus Lewis, who appeared for the plaintiff, said that the defendant was in a position to pay, as he was carrying on a thriving business in the Holloway-road. This statement was denied by the defendant, who said that it was simply through the assistance of friends he carried on his business in the Holloway-road, as they considered it would ultimately prove a success. In cross-examination by Mr. Lewis defendant said he had a business in Blackfriars-road; he owed some rent, and left because he did not wish to owe his landlord any more. He denied ever making money at billiards, but admitted playing for several years; he did not, however, bet. Mr. Lewis pressed the court for an order against the defendant, as this season of the year was the photographers' harvest, and as the defendant was continually changing his address he would escape payment altogether. His honour thought the defendant was not in a position to pay at present, and he would, therefore, adjourn the case for two months, in order to give the defendant an opportunity of bettering his position.

Our Editorial Table.

Descriptive and Illustrated Price List of Photographic Materials.

London: W. W. Rouch and Co.

A closely-printed *brochure* of ninety-six pages attests the variety and extent of the photographic materials and appliances manufactured or sold by Messrs. Rouch and Co.

Observing, among the numerous forms of cameras illustrated and described in these pages, the once well-known Kinnear camera, we are tempted to inquire if anyone now uses this camera in its smaller form, or has it been entirely superseded by square bellows-bodied cameras of more recent introduction? Several years have elapsed since among our numerous photographic acquaintance we have seen one of such cameras in use, unless of exceedingly large dimensions or of a pocket form. But this by the way. As we have said, there are enumerated in this catalogue all classes of cameras, including those of more recent introduction. What with lenses, plate-boxes, head-rests, retouching desks, baths, backgrounds, chemicals, and the other numerous articles required by the photographer, the book is filled to repletion, not to speak of the tents and collodions for the manufacture of which specialities this house has long had a reputation, and which receive a copious share of space in the present issue.

The catalogue also contains well-selected formulæ and hints for practice, from which we make the following extract:—

Time of Exposure.—No definite rules can be given on this head, as much depends upon the strength of the light, the focal length of the lens, and the size of the stop used. Negatives taken in a bright light and with short focus stereoscopic or *carte-de-visite* lenses develope readily, but pictures produced by lenses of long focus and small aperture the reverse. Hence, in the latter case, pains should be taken to hit the right time of exposure, and the collodion should not be too newly iodised. As a rule, if the image start out the moment the developer is applied the exposure has been too long. On the other hand, if it appear slowly and the deep shades are long in making their appearance the picture is under-exposed. A properly-timed picture makes its appearance gradually; first the high lights, then the middle or half-tones, and, lastly, the deep shadows. In the case of a landscape the sky should not be so weak as to print through much, nor should it be so intense as to obliterate every trace of cloud and atmosphere, and producing in the finished proof that photographic horror—a white sky. From the above we learn, therefore, that feebleness of the image may be caused by over-exposure in the camera. It may also be produced by the use of impure nitrate of silver, or the presence of too much nitric acid in the bath.

Miscellaneous Observations.—The temperature of the operating-room, as well as the various solutions, should never be less than 60° Fahr. during the winter months, otherwise a very great loss of sensitiveness will ensue. The plain collodion should be kept always in a dark and cool place, or the ether will gradually form ozone, and acquire the property of striking an immediate brown colour on mixing with the iodising solution. In warm weather the collodion will sometimes flow thickly after a few plates have been coated. A mixture of the best ether with an equal bulk of absolute alcohol is proper for diluting it. In very hot weather it is sometimes an advantage to dilute only with "absolute" alcohol (sp. gr. ·805), adding one drachm to each ounce. This will remove greasy lines and prevent the film from becoming surface-dry. N.B.—Do not attempt to use impure "methylated" ether and alcohol for diluting, otherwise an excess of free iodine may be eliminated and the sensitiveness injured. In hot weather the plate must not be kept too long before dipping, or between sensitising and development, otherwise the film will become partially dry, and a loss of density will result. Another cause of weakness of the image is an improper mode of applying the developer, viz., scattering too large a quantity over the film, so as to wash off the greater part of the nitrate of silver. The density of the negative will also vary much with atmospheric conditions imperfectly understood, the same collodion giving sometimes a weak and sometimes a strong picture.

Causes of Failure.—*Excessive Intensity* may be due to under-exposure in the camera, the presence of methylic ether in the collodion, or to great brilliancy of the light. If the nitrate bath be in good order the use of a weak sulphate of iron developer will often prove a remedy.

Lines Running Down the Film like streams of muddy water may be caused by dipping the plate too soon, removing it from the nitrate bath before the ether has been washed away, and not draining properly. They are more liable to happen when the bath has been long in use. The direction of the plate must not be changed after it has been placed in the slide, or lines will almost certainly be produced.

Straight Black Lines, taking the direction of the dip, are remedied by giving the plate a lateral motion immediately after putting it into the bath, or lift the plate in and out of the bath immediately after immersion.

Comb-like Markings often result from the collodion becoming surface-dry before immersion in the nitrate bath.

Transparent Wavy Markings at the most depending part of the plate are produced by the bath liquid accumulating at the lower edge, and will be obviated by draining more closely, also by holding the plate a few seconds longer before dipping.

Dust and scraping of the door of the slide are common causes of spots on the film. Transparent specks, with a central black nucleus, almost invariably originate in the camera.

Pinholes are frequently produced by leaving the plate a long time in the nitrate bath; a careful inspection, previous to development, will in such a case show little points projecting from the sensitive surface. Pinholes may also arise from the use of a muddy developer, a prolonged intensification on a weak image, a nitrate bath saturated with acetate of silver, or an excess of iodo-nitrate of silver, especially in warm weather. In the latter case dilute the bath with its own bulk of distilled water, then filter, and add sufficient silver to make up the proper strength.

Blurring, or reflection from the back surface of the glass, often seen around the edges of windows in interiors, may be prevented by laying a piece of moist red blotting-paper on the back of the plate. This should be done also when copying white and black maps, &c.

Fogging often indicates a bath out of order (in which case the shorter the time that the plate remains in the bath after the film has been formed the better) or the presence of the diffused light in the camera or developing room. Impure gutta-percha or ebonite is injurious to the silver solution, and produces decomposition.

The Film Splitting off from the glass on drying. The liability to peeling off is greatly increased by long development and subsequent over-intensifying. Try a little longer exposure and shorter development.

Want of Intensity. The light is bad, excess of nitrate acid in the bath, the bath is weak, or the collodion is pale yellow or colourless. Remedy: add a few drops of tincture of iodine to the iodised collodion, or a few grains of acetate of soda to the developer.

White Marble-like Stains of reduced silver on the surface of the film. This effect is most certainly produced by a dirty state of the corners and sides of the dark slide. The remedy is obvious: carefully wash and wipe the dark back when finished with; also varnish the corners with sealing-wax varnish. All wet-collodion slides should be provided with a groove at the lower edge (first introduced by W. W. Rouch and Co.) to catch the drip. A small strip of clean blotting-paper should also be placed along the bottom of the plate at the back.

A More Intense Action of the developer in one or more portions of the plate. This is frequently met with in an old much-used bath, and arises from the accumulation of the liquid in drops or beads upon the surface of the plate. Remedy: boil down the nitrate bath in a glass flask to one-half, then add the requisite quantity of distilled water, a few crystals of nitrate of silver, and one or two drops of nitric acid.

Want of Half-tone may be caused by a bad light, insufficient exposure, and subsequent over-intensifying.

Want of Detail in the shadows, with the high lights very intense, are evidences of under-exposure in the camera.

Flatness, on the other hand, is the result of over-exposure; it may also be caused by insufficient intensifying or fog produced by diffused light, &c.

Dublin University Magazine.

London: Hurst and Blackett.

The August number of this magazine is enriched with an exceedingly fine and delicate portrait of Mr. Tom Taylor, journalist, poet, dramatist, critic, and, we might almost add, actor, seeing that Mr. Taylor was for many years a prominent member of an amateur society, "The Canterbury Theatricals." But it is with the portrait rather than with the man, eminent though he be, that we have now to do. Printed by the Woodbury process from a negative by Messrs. Window and Grove, we find in this portrait a most skilful carrying out of a somewhat difficult part of the genus *homo*, viz., a copious, flowing white beard, which is full of detail, and sharp without being hard. In addition to an article by Mr. Francis R. Conder, C.E., *On the Occult and its Professors*, upon which it is not necessary that we should express any opinion, Lady Wilde continues her *Fairy Mythology of Ireland*. In *The Labourer's Leisure*, by Dr. Keningale Cook, this writer suggests various ways by which instruction and amusement may be combined during the evenings when business is relaxed. Among these the following is suggestive:—

> "Again: the magic lantern and the microscope open out endless fields for ingenuity in the direction of interesting topics. If any useful study is too small or vague for the uninstructed mind let it be made large and real. Cleanliness might be much benefited by a few painted slides showing the flea gigantic; or an interesting and instructive photograph would be that of a magnified section of the skin of a man who washed and one who did not."

The admirable article by Professor Huxley, F.R.S., *On Elementary Instruction in Physiology*, is one of a class that might be advantageously extended to other departments of science.

Street Life in London.

London: Sampson Low and Co.

The seventh part of this interesting work, for August, contains a group of a character to be seen in numerous side streets of the less aristocratic portions of the metropolis, namely, a group of boys of the small 'prentice class standing round the barrow of an enterprising caterer, who is doling out ices at a halfpenny a glass to the possessors of hot mouths and of coins to the extent indicated. Of greater merit, from the photographic point of view, is the group entitled *Cheap Fish of St. Giles's*, although in this picture it is somewhat apparent that some of the group were far from unconscious of the fact that they were standing for their portraits. *Black Jack*, a costermonger riding in a donkey-cart, forms the third of the illustrations in this part. As usual the descriptive matter is well and tersely written.

Meetings of Societies.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

On Thursday, the 2nd instant, a meeting of the Board of Management of this Association was held at the office, Fleet-street.

The minutes of the previous meeting having been read and confirmed, Mr. James Henderson was elected an ordinary member of the Association.

A new edition of the rules having been printed, it was decided to send them post free for six stamps [see advertisement]. Several alterations having taken place it was considered advisable for all members to possess the latest edition. All information concerning the Association will be found in this book.

The next meeting will take place on Thursday, the 6th of September.

FRANKFORT-ON-MAINE PHOTOGRAPHIC SOCIETY.

The last meeting for the season of this Society took place on the 6th June, when Herr van Bosch occupied the chair. After the minutes of the previous meeting had been read and approved, two new members were admitted; and the President read a letter from Dr. Hornig, expressing his warmest thanks for the album sent him by the Society.

Dr. Stein then made a communication, to the following purport, with regard to his latest photographic experiments:—I saw clearly, in the course of my various scientific researches, the importance of being able to determine exactly the time which elapses between the opening and shutting of the lens—not only when the subject taken is required for a scientific purpose, but whenever one wishes to reproduce photographically infinitesimal movements. However quickly one opens or shuts the lens by hand the action will occupy at least one-tenth of a second. This, at least, was my experience when I photographed the vibrations of a musical pitch-fork; and as there are motions which vibrate a dozen times in the tenth of a second, and as these vibrations can be photographed, it is evident that there can be no further question of the unsuitability of this method of opening and shutting, and that an instantaneous shutter must be found the duration of whose action shall scarcely be felt upon the scale of time. This can only be actually done by an electro-magnetic arrangement, and the solution of the puzzle is obtained by combining the action of light with that of electricity. I therefore arrange the dark slide, which slides past the lens by means of a spring, so that in passing it opens and closes a galvanic stream by means of a pin. This galvanic stream runs round a small electro-magnet, to the cross-bar of which the lens shutter is attached, by means of a slight double crank. When the electric current is allowed to run round the magnet the latter becomes magnetic and draws the cross-bar towards it, thereby closing the shutter of the lens. The instant, however, the peg is drawn along to the place where it stops the electric current the power of the magnet ceases, and the shutter opens instantaneously, to shut again the instant the dark slide glides past. At the other end of the latter there is a second pin which springs into the opening of the electric current and shuts it off, displacing the little magnet once more, which, in turn, brings the shutter in front of the lens again. In the same way the dark slide is moved along and closed after a sufficient exposure. Two other kinds of apparatus are combined with this arrangement—a chronoscope and a galvanometer. Both are enclosed in the case containing the galvanic battery. The chronoscope is intended to indicate the time occupied by the passing along of the dark slide, which it does exactly, even to the thousandth part of a second. The galvanometer is required so as to make sure of a current of the same strength being used at each experiment, as the stronger the current the quicker the cross-bar is drawn towards the magnet. The slower or more rapid approach of the cross-bar to the magnet may give rise to a difference of from one-five-hundredth to a thousandth part of a second. The time required for the cross-bar to touch the magnet and to shut the shutter must be ascertained by experiment with the battery.

A number of interesting experiments were then performed by Dr. Stein, showing the varying susceptibility to electricity of some twenty of the elements, of most of which an account is given in his recent publication.

The meeting was then adjourned for the holidays, no date being fixed for reassembling.

Correspondence.

Developing Emulsion Negatives.—Chrysoïdine.—The Preparation of Emulsions.—Photo-Ceramics.

The general meeting of the Photographic Society of France took place on Friday last, the 3rd inst.,—M. Davanne in the chair. Few members were present as it required a great amount of moral courage to face the excessive heat at the moment to be encountered in Paris, besides the holidays being so near.

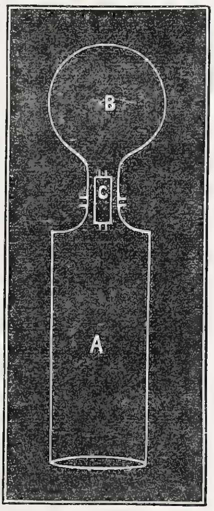
M. Andra, the well-known amateur, made a very interesting communication on the development of emulsion plates. According to his opinion the wetting of the film by alcohol before development is a very necessary operation, in proof of which he presented the Society with several negatives, one half of which had been washed with alcohol, and the other with water. The half which had been washed with alcohol was strongly defined in its half-tones and harmonious in its high lights—in fact, a good negative; whereas the half only washed with water was feeble and presented the appearance of an under-exposed plate, or one developed with a solution of bicarbonate of ammonia instead of carbonate of ammonia. He (M. Andra) said that he was of the opinion that exposure could be shortened by a thorough washing with alcohol. He furthermore stated that he did not appreciate the employment of glucose as an intensifier or as an accelerator; in his opinion it was a restrainer.

Now I am not of M. Andra's opinion on this subject, for by the addition of the glucose solution to the developing bath I obtained not only intensity but the development of half-tones invisible by the alkaline development. Perhaps it is because I have modified the formula as follows:—

Distilled water	5,005 grains
Glucose	770 ,,
Alcohol	1,925 ,,
Ammonia	12 to 20 drops.

When the image has appeared and the half-tones are coming out I add a small quantity of this solution to the alkaline developer, which not only brings out the half-tones, but begins intensification; another addition makes the blacks very intense indeed.

I was then called upon by the Chairman to make a presentation and communication on the chrysoïdine, which I did as follows:—At your last meeting M. Bardy made a communication on the great value to photography of a colour called "chrysoïdine," on account of its anti-photogenic properties. Since that meeting I have made several experiments with the chrysoïdine dye, in one of which I covered the pane of glass now before you with a collodion stained with that dye. An emulsion plate was placed under a negative in a printing-frame. The frame was covered by the coloured pane of glass and exposed on my balcony to the diffused light of day. One part was exposed for five minutes, the second part ten minutes, and the third fifteen minutes. The plate was then plunged into the alkaline developer, but no image was obtained; whereas without the chrysoïdine-coloured pane a positive could have been made in a fraction of a second. I also presented sheets of paper dyed by the chrysoïdine, together with gelatine films stained by the same product; also a varnish by which glass chimneys for gas and oil lamps can be coloured by simply dipping them into the solution. I concluded by expressing my opinion that M. Bardy had done a great service to photographers by making known a product which will permit them to work in their dark room without the fear of fog, &c.



The Chairman then made a series of observations on the preparation of emulsions, the non-success he had had, and how he succeeded at last. He said it was impossible for him for a long time to obtain a fine emulsion free from grain, &c. At last he thought of the simple apparatus then before them, and immediately all his trouble ceased. This apparatus consists of a glass bottle (A) of any capacity whatever, a glass flask (B), and a cork (C) perforated through its centre with a glass tube fixed in the hole. Let us suppose that an emulsion is to be made. The bromised collodion is poured into the bottle, and the cork inserted into its neck (the cork, being long, stands out a certain length). The nitrate of silver solution is introduced into the flask (B). This being ready—that is to say, the silver completely dissolved in the hot alcohol—the bottle is taken (the finger being put upon the glass tube) and turned upside down, and attached by the cork to the flask. If this movement be done slowly and cleverly no collodion will escape. The bottle is now turned into its former position and well shaken. Each movement will precipitate a few drops of the silver solution into the collodion, and the bromide of silver will be formed slowly, and in such a finely-divided state difficult to obtain by any other method. The simplicity and the usefulness of this apparatus will, I have no doubt, attract the attention of the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY; and, as I have already employed it, I can vouch for its usefulness. The rapidity of the fall of the nitrate solution can be regulated by the size of the tube through the cork. Mine is three-sixteenths of an inch in bore.

The Chairman futhermore informed the Society that, owing to previous non-success with emulsions, he found himself in possession of about a quart of emulsion which he did not know what to do with, and it being rather unpleasant for him to waste it by throwing it down the sink, he determined to make some experiments upon it. [I must here say that M. Davanne has always been a most skilful manipulator of Taupenôt's process, in which the plate is sensitised in a bath in the open light of day, after which a bromo-iodised solution of albumen is poured over the surface. The plate is then exposed to full light; after being a second time sensitised in the silver bath it is ready for use and works admirably.] He (M. Davanne) thought that if he followed the same treatment with the emulsion probably the results would be identical. He put all his emulsions into a large bottle, and added 1,540 grains of bromine collodion. Bromide now being in excess the bottle was placed in the sun and well shaken now and then. After a few days a solution of nitrate of silver was added, so that the slightest trace, and only a trace, of nitrate of silver could be discovered by analysis. A solution of a metallic chloride was then added, with the double intention of converting what remained of the silver nitrate and for clearing fog. This emulsion was then allowed to ripen for several days, and then precipitated in the usual manner. The product when redissolved gave a beautiful, even film, clear from fog—in fact, gave negatives equal to newly-made emulsions not having undergone that severe ordeal.

During the evening some very fine proofs were exhibited in fatty-ink as well as in silver salts, by M. Lecadre and M. Amand-Durand.

M. Bonnaud passed round for the inspection of the members some very fine specimens of chinaware, which had been decorated in colours by means of photography. In answer to the questions, that gentleman said he could not enter into an explanation of his process as it was a secret. He could only say that for ease and facility in manipulation none could vie with it, and that a china vase which would cost in its decoration from £2 to £3 could be done by him for seven or eight shillings.

Here is a new process which it may be truly said bids fair to enable us to decorate our dwellings, and so surround ourselves with objects of art which speak at once to the mind and ripen our intelligence. It may be asked—What would Caractacus say if he could now see a humble dwelling in Britain? E. STEBBING, *Prof.*

3, *Place Bréda, Paris, August* 6, 1877.

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CHRYSOÏDINE.

To the EDITORS.

GENTLEMEN,—Can you or any of your readers tell me where to obtain chrysoïdine—the dye mentioned a week or two ago by your Paris correspondent as so satisfactorily cutting off all the actinic rays?

In common with many other experimentalists I have lately been driven nearly wild with transparent spots in washed emulsions.

I hope shortly to write a little on these "torments," in the hope that the cause and cure may perhaps in due time be ascertained.—I am, yours, &c., HENRY COOPER.

Homehurst, Torquay, August 4, 1877.

[We are unable to give the required information respecting chrysoïdine. We shall, however, await with much impatience Mr. Cooper's notes on the transparent markings in washed emulsions; for it is a subject that possesses interest for a large section of our readers.—EDS.]

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MOIST EMULSION PLATES.

To the EDITORS.

GENTLEMEN,—I, for one, would be very much obliged to Mr. William Brooks if he would kindly give the particulars of the formula for his prepared "moist collodio-bromide plates" mentioned in your last issue among the "Answers to Correspondents."

Perhaps a request from you would have the desired effect.—I am, yours, &c., THOMAS PROTHEROE.

Wine-street, Bristol, August 4, 1877.

[As Mr. Protheroe utters the sentiments of many of our readers we prefer that he shall in this public manner make the appeal himself, being well assured that if it be at all possible to do so Mr. Brooks, who retains no secrets, will lend a favourable ear to the request.—EDS.]

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PROFESSOR BUNSEN.—"C. P. S." writes to us from Heidelberg, under date July 30:—"The University of Heidelberg commemorated last week the 25th anniversary of Professor Bunsen's election to the chair of experimental chymistry. Students of all faculties joined in a torch-light procession, which was followed by the traditional symposium, while a deputation presented the congratulations of the Academical Council. Professor Bunsen held the chair of chymistry in the Universities of Marburg and Breslau before he was called to Heidelberg, and, as is well known, declined a few years ago a call to Berlin, which he received at the same time as Professor Kirchhoff, with whom he is the founder of stellar chymistry. Though at the age of sixty-six, Professor Bunsen completes his fiftieth course of lectures at Heidelberg in the full vigour of both mind and body. From the spectrum analysis down to the simplest manipulations of practical chymistry, his luminous discoveries have rendered the most distinguished services to the science which he adorns; but he possesses at the same time the rare gift of being an eminent and most inspiring teacher."—*The Times.*

◆

EXCHANGE COLUMN.

A cabinet burnisher offered for any photographic exchange.—Send offers to LANGTON, Broadway, South Hackney, London.

A *carte* lens, by Alex. Gaudin, No. 9,397, will be exchanged for anything useful.—Address, MANAGER, 68, New-street, Ashford.

A ½-plate lens and a mahogany sliding body camera with repeating back will be exchanged for a developing box, dark tent, or anything useful.—Address, JOSEPH MANSFIELD, 72, North-street, Scarborough.

ANSWERS TO CORRESPONDENTS.

Photographs Registered—

Hugh Owen, Barmouth, North Wales.—*Photograph of the Cottage of Cadwaladr Jones.*

William J. Hogg, Glasgow.—*Photograph from an Oil Painting, by "Dudgeon," entitled "Tam O'Shanter."*

John Rishton, Haslingden, near Manchester.—*Two Photographs of the interior and exterior of St. James's Church, Haslingden.*

☞ *Correspondents should never write on both sides of the paper.*

Notice.—Each correspondent is required to enclose his name and address although not necessarily for publication. Communications may, when thought desirable, appear under a *nom de plume* as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

Ellerslie Wallace, Jun.—Your request shall receive attention.

Novice.—There is no remedy for the imperfection of the lens but the employment of a smaller diaphragm.

C. J. Witcomb.—Your notes will be appreciated by many readers. We shall make inquiry concerning a suitable person.

W. H. Kirkby.—When there is an albumen substratum the plate usually requires a prolonged soaking in water before the film will leave the glass.

R. L. Jones.—1. Acetate of soda is soluble in four parts of water at 60° Fahr.—2. The Archer lens will, as regards rapidity, be nearly equal to the modern one mentioned.

W. Thompson.—Albumen may be kept in a good and sound condition for some time by the addition of either ammonia, camphor, or charcoal. There are several other substances by which it may be preserved.

G. Wheeler.—1. The yellow substance is iodoform. It is freely soluble in alcohol, although insoluble in water.—2. Yes.—3. It is very probable that the castor oil would become more soluble in alcohol by the addition of camphor or benzoic acid.

A. C. Stephens.—You cannot obtain a patent for a combination in which a single anterior lens of crown glass is corrected by a posterior lens overcorrected for colour, because such lenses have already been described, and are not, therefore, new.

X. Y. Z.—1. The work is said to be out of print.—2. Some of the manuals published by the artists' colourmen will probably afford you the required information.—3. This query embraces a subject amply treated in one of the manuals devoted to crayon drawing.

Thos. Stuart.—The proprietor of a house can no more hinder you from photographing it from a public road than he can prevent you from looking at it, nor can he prevent you from selling the picture among any other views you may be able to obtain from the same road.

P. Duncan.—The present value of the apparatus of which you send a list is between eight and ten pounds. We can readily enough understand how such apparatus cost thirty pounds, but that was "long, long ago," and fashions have changed within the past twenty-two years.

Fog.—To cure surface fog, which is often caused by the use of a new and unripe collodion (especially during hot weather), add a little nitric acid to the bath and allow it to stand for a few hours. A few drops of tincture of iodine added to the collodion usually answers the same purpose.

Frank Jackson.—The waxing of paper may be effected either by warming the paper upon a hot slab and rubbing the wax all over the surface, or by brushing it over with a solution of wax in turpentine. In the former case the superfluous wax must be removed by placing the waxed paper between two sheets of blotting-paper and passing over it a hot iron.

Geo. Hunter, Jun.—We must respectfully decline entering into the discussion between your correspondent and yourself respecting the question—What constitutes a true artist? In photography some of the poorest pictures, in every sense, we have seen have been executed by gentlemen who, on their business cards, invited special attention to the fact that they were "artistic photographers."

G. G. B.—The various pigments named in your letter can all be easily obtained from the dealers that are to be found in or close to Long-acre. Permit us to observe that, owing to your imperfect knowledge of pigments and their permanence, you will be able to discover numerous other walks of life in which you would be more useful to your fellow-beings than in compounding colouring materials for gelatine to be used in the preparation of carbon tissue.

N. D. A.—Although we believe you to be in error in attempting to cultivate a love for the old and now effete oxymel process, we are quite willing to lend you a helping hand in your preliminary trials with it, believing, as we do, that you will be dissatisfied with its slowness. After removing the plate from the nitrate bath, wash it well, and then apply the oxymel preservative. If greater sensitiveness be desired, do not wash the plate, but only drain it previous to applying the preservative.

Cheap Jack.—The difference as respects covering power between a landscape lens of large diameter as compared with one of small diameter is mainly this—a much larger diaphragm may be employed with the former than with the latter. It is true that there will be no difference in the central or axial pencils; but the margin of the picture will suffer very much, because, in order to obtain a field of illumination of sufficient dimensions, the stop will have to be placed close to the lens, and this is fatal to excellence of marginal definition.

James Shaw.—Thanks for enclosure. The nature and preparation of toughened glass is a subject possessing great interest for photographers.

W. R. (Liverpool).—To make a collodion transfer all that is required is to press the transparency to be transferred into close contact with the sheet of paper upon which it is finally to rest, and allow it to remain until thoroughly dry. In the preparation of the transparencies a tough collodion containing free iodine must be employed. The negative may be placed against the sky, or against a sheet of white cardboard, as a backing. The lens must be used with a small stop to ensure sharpness, and in the development great care should be taken to retain the whites in a state of the utmost purity.

Finem Respice.—This correspondent says:—"I shall be very much obliged if you will kindly inform me whether any of your correspondents have tried the process of saccharate-of-lime development described by M. Davanne on page 58 of The British Journal Photographic Almanac, 1877. I believe that if the nuisance of carbonate of ammonia (or liquid ammonia) could be got rid of emulsion dry plates would be much more used than they are."——Pending the receipt of the experience of any of our readers who have tried the saccharate of lime, we may remind "Finem Respice" that ammonia, in either of the two forms mentioned, may be superseded by carbonate of soda. In our issue of June 22nd, page 298, we published a formula, by Mr. H. J. Newton, in which "sal soda" (common washing soda) is made to take the place of the ammonia, and with an alleged advantage. It is true that a rider is attached to this formula in which it is stated that by the addition of diluted ammonia the energy of the developer is increased; still the fact remains that negatives of good quality may be developed by the soda alone. The late Mr. Thomas Sutton possessed a strong belief in the efficacy of carbonate of soda in alkaline development. We shall be glad to have the experience of our readers in this direction.

Received.—*Night and Day*, Nos. 7 and 8.

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The British Association.—The Plymouth meeting, we understand, promises to be a large and interesting one. It commences on Wednesday next, under the presidency of Professor Allen Thomson, M.D., LL.D., F.R.S., &c.

South London Photographic Society.—On Saturday last the members of the South London Photographic Society met in the evening at the Mitre Hotel, Hampton Court. Only two members had taken their cameras, and these, during the afternoon, found ample scope for the indulgence of their artistic proclivities in the fine scenery peculiar to the Thames in the vicinity of Hampton Court. It is not, perhaps, generally known that numerous boats are on hire, both above and below Moulsey Lock, a few minutes' walk from Hampton Court, and that within a distance which can be rowed in a quarter of an hour up the river there is a little island, richly clad with trees, upon which the photographer may land and secure numerous artistic "bits," with the island itself and its vegetation as a foreground, the river, with its charming reflections, occupying the middle distance. Of the pictorial treasures to be seen in Hampton Palace itself little need be said, as they are known to every connoisseur; but we may here observe that no one is allowed to photograph within the palace grounds without permission being first obtained, which, however, can easily be secured. After tea, the members present indulged in genial conversation for a couple of hours, after which they returned home much satisfied with their visit to this pleasant metropolitan resort.

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METEOROLOGICAL REPORT.

Observations taken at 406, Strand, by J. H. Steward, Optician.

For two Weeks ending Aug. 8, 1877.

These Observations are Taken at 8.30 a.m.

July.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks
26	29·73	W	62	63	74	56	Dull
27	30·13	W	58	62	74	54	Dull
28	30·17	W	56	61	78	53	Dull
30	30·29	W	60	63	86	58	Dull
31	30·06	W	63	71	89	60	Fine
Aug.							
1	29·86	NW	56	62	—	58	Cloudy
2	29·95	NW	53	59	69	51	Cloudy
3	29·99	NW	52	59	70	49	Cloudy
4	30·04	NW	55	59	71	53	Cloudy
6	29·99	SE	64	70	77	59	Fine
7	29·69	W	63	69	71	63	Fine
8	29·50	SW	60	63	—	56	Fine

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 902. Vol. XXIV.—AUGUST 17, 1877.

NEW METHOD OF PREPARING GELATINE EMULSION.

In the preparation of a gelatino-bromide as well as of collodio-bromide emulsion there are certain salts often left as waste products. All that is necessary or desirable to be present in an emulsion is the bromide of silver on which it is to be dependent for its sensitiveness.

But in the admixture of the elements upon which the formation of the bromide of silver depends other salts are produced as by-products; and these, although not perhaps exercising much influence, in a chemical point of view, yet most unmistakably and from the physical standpoint do clog up the film with bodies which, while useless in themselves, occupy space in the film that could be much more advantageously replaced by more active bodies.

Every tyro in chemistry knows that if bromide of potassium and nitrate of silver be mixed, each being previously in solution, bromide of silver (a fine powder) and nitrate of potash (a crystallisable substance) are formed. The former is the active element in the preparation of a sensitive surface, while the latter is simply "matter in the wrong place" so far as regards the formation of a sensitive film; and both from the chemical and physical points of view its elimination is a desirable matter.

There are two recognised methods, each distinct in itself, by which the nitrate of potash or any other base can be removed from any solution of gelatine. The first is one which can never be mentioned without reflecting credit upon Mr. Joshua King, with whom it originated; we mean the applications of the principle of dialysis, by which the whole of the crystallisable salts are made to pass through a septum from the gelatine into plain water, by which nothing is left mixed up with the gelatine but the insoluble bromide of silver. The application of this principle is, as we said when first announcing it a few years ago, an exceedingly "happy thought." In practice it resulted in Mr. King being able to make an excellent emulsion by mixing together the soluble bromide and the nitrate of silver with the gelatine, and placing the whole in a dialyser, by which the soluble salts that result from the mixture are withdrawn from the gelatine.

The second method was that described and patented by Mr. R. Kennett, in which the gelatine, with the whole of the salts, was poured out into a dish or upon a slab and allowed to set, and then well flooded with water, by which, on the *principle* of dialysis, although not exactly by the same method, the nitrate of the base was dissolved out from the thick film, which was afterwards dried and pulverised ready at any subsequent time to be dissolved.

We have now to describe a third method of eliminating the soluble salts, and one which, while not only scientific and beautiful in principle, appears also to be excellent in practice. We are indebted for it to Mr. F. Wratten, of the firm of Wratten and Wainwright. This gentleman, while preparing gelatine emulsions, was struck with the great waste of time that was the inseparable concomitant of any attempt to separate the soluble salts by means of dialysis. He was led to inquire whether, when once the emulsion had been made, the whole of the water, or nearly the whole, which had been of necessity employed in the preparation of the various solutions could not be drawn off from the gelatine; in other words, whether the gelatine could not be precipitated along with the bromide of silver, leaving as the supernatant fluid the water which contained in solution all the soluble salts.

As the result of his cogitation Mr. Wratten was led to make a trial of methylated spirits of wine, which, while mixing very freely with water, is quite inimical to entertaining such friendly relations with gelatine. The result of an experiment proved the correctness of the hypothesis. Upon a gelatine emulsion being prepared, and a quantity of alcohol being poured in and stirred up with the emulsion, the gelatine very soon showed indications of settling down at the bottom of the bottle, leaving the clear liquid, alcohol and water, at the top. This was eventually poured off, and what concerns us at present to know is that this liquid contains everything that is soluble. We have seen the precipitation of the gelatine effected by Mr. Wratten, and from notes made on the occasion we believe that we are in a position to afford some interesting and practical information as respects the details of the method in question.

Starting with the gelatine: Mr. Wratten selects the No. 1 gelatine of Nelson and Co. as being better adapted for this purpose than any other sample he has hitherto seen. Of this gelatine eighteen grains are placed to soak in half-an-ounce of water, in which has been previously dissolved eight grains of bromide of ammonium. When this water has been absorbed, or nearly so, by the gelatine, heat of 100° Fahr. is applied, by which the gelatine is dissolved. In the meantime, fourteen grains of nitrate of silver having previously been dissolved in an equal portion of water, and the solution having been raised to the temperature of the gelatine solution, it is poured, very slowly and with constant stirring, into the gelatine, this addition being followed by a brisk shaking of the bottle for some time, so as to ensure the proper mixture of the salts. Prolonged digestion at this stage being favourable to sensitiveness, it is advisable to allow the mixture to rest for about three hours or longer. At the end of that time about two ounces of alcohol are poured into the bottle containing the emulsion, and, after thorough agitation, the whole is allowed to repose. In a very brief time, and when the gelatine emulsion has assumed the appearance of a pasty mass, the bottle is inverted when the water and alcohol will flow out as an opalescent fluid containing the whole of the soluble salts, which, if allowed to remain present, would, when a plate was prepared with the gelatine emulsion, crystallise out on the surface and entirely disintegrate the film. To ensure the elimination of the water it may be necessary to masticate the nearly-solidified emulsion with a strong glass rod, so as to break up the chambers contained in its body, and thus liberate such fluid as may be present.

By subjecting to examination the fluid thus poured off it will be very easy to ascertain whether the gelatine has been emulsified under circumstances indicating the presence of excess of either the silver or the soluble bromide; and this affords a gauge by which can be determined with great facility the presence of even the minutest excess of either. It is to be noted that, while a large quantity of fluid will run out when the bottle is first inverted, the outflow is continued as a gentle trickle for some time.

The emulsion having been reduced to a state of semi-solidity in the manner described, it may be either desiccated for future use or be at once dissolved by adding the requisite proportion of warm water.

The subsequent behaviour of a film obtained from gelatine treated in the manner described appears to favour the idea of a portion of the alcohol being still present—an idea adumbrated by the great readiness with which plates set after being coated with the emulsion.

We have no doubt that the ingenious process of Mr. Wratten will be tried by many of our readers, and that we shall, ere long, receive a record of experiments made in this direction. It is also not improbable that, as soon as we have leisure to make a trial of the method, we shall lay before our readers the result of our own investigations.

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ON THE CAUSES WHICH AFFECT THE GRANULARITY OF BROMIDE FILMS.

If, as suggested by Mr. Berkeley's recent article, it be true that the state of division of the silver bromide in photographic films bears a direct relation to their sensitiveness, a new importance is given to the means by which the bromide may be deposited in any required degree of fineness, so as to enable us to obtain at will either rapidity or density. But though we are willing to grant that in some cases the facts would justify the belief that such a relation exists, we are not prepared to accept it as an invariable rule; indeed, the means are so various, and at the same time so simple, by which a coarse film may be obtained, that were sensitiveness dependent solely upon that condition the problem of extreme rapidity would be very easily solved.

Obviously, however, the mere state of division of the bromide, *per se*, can have no direct bearing upon sensitiveness, though it undoubtedly has upon the general working qualities of the film, and possibly upon the density of the image. The real facts probably are that, in the presence of certain conditions favourable to sensitiveness, the actual result may be more or less modified by accidental or, at least, independent circumstances affecting the physical state of the deposited bromide—or, in other words, when the proportions of bromide and silver are such as to produce rapidity, varying conditions may be introduced which affect the sensitiveness as well as the physical character of the resulting film.

Before proceeding to enumerate the various modifying causes, it may be as well to state that these remarks are made chiefly in connection with emulsions, as, in the case of plates prepared with the bath, there is comparatively little scope for altering the nature of the deposit. We may, however, cite one instance which would appear to bear upon the subject; we allude to the preparation of bromised plates with the bath. It is well known that, when a simply-bromised collodion is sensitised in a bath of the ordinary strength of thirty-five or forty grains to the ounce, a thin, transparent film results, exhibiting no special attributes in respect of rapidity, and yielding a weak, poor image. If, however, the strength of the bath be increased to eighty grains, the same collodion gives a film differing very materially in its physical character. The thinness and transparency give place to a dense and somewhat opaque deposit, the sensitiveness and quality of the image being improved to an astonishing degree. Now, the fact that no prolongation of the action of the weak bath will produce a similar result points directly to an altered physical condition of the layer of bromide; and if opacity of the film mean coarseness of deposit—as judging by analogy from emulsion films we may suppose it does—we have a clear example of the co-existence of granularity and sensitiveness. At the same time, it is but fair to notice that the gain in rapidity is accompanied by a gain in density, which does not accord with the theory that density is dependent upon fineness of division.

Turning to emulsions: the causes which affect the fineness of the suspended bromide may be divided into two classes—chemical and mechanical—or those in which the change is produced by the reaction of the salts themselves and those in which it is due to variations in the manner of manipulation or in the mechanical state of the collodion. The nature of the pyroxyline, which exercises a very great influence upon the character of the film, is difficult to classify, and may be treated separately. If, as some assert, a true compound is formed between the silver bromide and the pyroxyline, the action must be considered as chemical; but if, on the other hand, the varying viscidity of the collodion be responsible for the change by virtue of its power of retarding chemical action, we should be inclined to class it as mechanical. Be this as it may, it is an undoubted fact that, *cæteris paribus*, two samples of pyroxyline may yield emulsions widely different in physical properties as well as in sensitiveness.

It is not our province here to enter into a discussion of the comparative merits of high and low-temperature pyroxyline; suffice it to say that, as a rule, the high-temperature or organic pyroxylines yield more "creamy" films than those prepared at a lower temperature, and are usually held to be more sensitive. But we cannot from this deduce any argument in favour of the theory of sensitiveness going hand in hand with a coarse film—that is to say, coarse as regards the particles of silver bromide, for the emulsion itself is generally transparent enough, and free from any approach to granularity, the "creaminess" or density of the film being mainly due to the physical peculiarities of the layer of pyroxyline *after* drying. These descriptions of pyroxyline dry with a lustreless, dusty appearance on the surface, and a certain amount of density due to want of transparency when viewed by transmitted light. It is plain that if the film be clear and transparent before drying the silver bromide must be in a certain state of fineness, and if, in drying, its appearance be changed we cannot reasonably suppose that it is the bromide which undergoes change. We must rather attribute the effect to the structural peculiarities of the pyroxyline, which no doubt conduce to the production of sensitiveness, quite irrespective of the mechanical state of the bromide. It will be well to distinguish between this description of coarseness in the film and that arising unmistakably from granularity of the bromide; the latter form will be visible in the emulsion itself, which, when shaken against the side of the bottle, and viewed by transmitted light, will exhibit a slight dulness or want of transparency.

Perhaps the most important of the chemical causes affecting the physical state of the bromide is to be found in the relative proportions of the silver nitrate to the soluble bromide. Thus we know that in the presence of a slight excess of the latter, a film is obtained in which the individual particles of silver bromide are so minute that a tolerably high power is necessary before they become visible under the microscope. Films so constituted have been spoken of as the finest obtainable by any collodion process extant. But if an excess of silver nitrate be used in sensitising the emulsion, it is found that up to a certain time after the silver is added the emulsion as well as the dried film remain clear and transparent; but when that point is passed it enters into what has been described as the "creamy" stage. This "creaminess" is due not to the formation of a larger quantity of bromide in the film, as may be easily proved by simple experiment, but to a change in the character of the film from transparency to opacity, and would appear to be caused by a rearrangement of the atoms of silver bromide—the effect of the prolonged action of excess of silver nitrate.

If we seek to establish any connection between the opacity of the film and the transmitted colour of the emulsion we fail entirely. The change in the appearance of the emulsion when it arrives at the "creamy" stage is not the same in all cases; for, though it almost invariably acquires greater density, this change is in many instances accompanied by a loss of transparency, and in others not. The colour may be either ruby, orange, or other lighter tent, depending altogether upon extraneous conditions. In very rare cases the dried film remains as thin and transparent as if prepared with excess of soluble bromide. Thus it would appear that, if colour is to be taken as a test of fineness, the sensitive films prepared with excess of silver may be either coarse or fine, and that there is no connection between their sensitiveness and the state of division of the layer of bromide. At the same time it must be remembered that there are many other conditions which probably may interfere with the result, and the only way to arrive at a definite conclusion is by a systematic series of experiments in which the conditions are so varied as to test the relative effect of each.

Another cause producing differences in the appearance of the film is the employment of different bromides. Thus, bromide of ammonium gives a rich colour both to the emulsion and the film, the latter remaining clear and transparent after drying. Bromide of zinc yields a deep-coloured emulsion, but the film upon drying becomes dense and opaque, much of the richness of colour disappearing in the opacity. The cadmium salt occupies a position midway between the two mentioned.

If we examine the working properties of these three bromides we shall find a remarkable coincidence in the results with what might be predicated if Mr. Berkeley's theory be accepted. Referring back to the exhaustive series of experiments on the behaviour of different bromides published by Mr. Warnerke some time ago, we find that he mentions bromide of ammonium as being specially noticeable for its property of giving density. To bromide of zinc he gives the foremost place in point of sensitiveness and a high position as regards density of image; while cadmium bromide occupies a slightly inferior position in respect of the same combination of qualities. No doubt if we extended the list further we might find the same relation exist, in the case of other bromides, between fineness and colour of the deposit on one side and sensitiveness and density on the other, but the instances mentioned will suffice. We have here the results of a course of definite experiments carried out under circumstances which preclude all possibility of a doubt as to the existence of some sort of connection between the physical and chemical properties of emulsions; but as to whether it is a case of actual cause and effect, or merely a series of accidental coincidences, it would be premature to hazard an opinion.

We shall mention one more disturbing element which, while possessing claims to be considered chemical, may at the same time, in a manner of speaking, prove to act mechanically. We allude to the presence of an acid in the emulsion during sensitising. The primary function of the acid is, of course, that of a restrainer of fog in the presence of free silver; but beyond that what effect has it upon the emulsion? It has, we know, the property of aiding precipitation and causing the formation of a coarser precipitate; it also exercises an action corrosive or otherwise upon dissolved pyroxyline, and, especially after prolonged contact, is capable of producing great structural changes in the nature of the film. Arguing from the first of these properties we might suppose that the use of acid would be conducive to granularity, and, *ergo*, if Mr. Berkeley's theory be correct, to increased sensitiveness, even in the presence of free bromide. As far as we are aware, however, facts do not bear out the truth of this supposition. The action upon the pyroxyline will depend upon the nature of the acid employed. Nitric and hydrochloric (which by decomposition of the silver nitrate liberates nitric) render the pyroxyline more porous or "rotten;" sulphuric, on the contrary, parchmentises it and increases the viscidity of the collodion.

The two first, then, would appear to further favour granularity, while the last would have an opposite tendency. Now, in the presence of free silver nitric and hydrochloric acids are found to be inimical to density; sulphuric acts favourably in that direction, and at the same time adds to the richness of the colour of the emulsion. In the presence of excess of soluble bromide the necessity for the use of acid ceases; but, from our own observation of the behaviour of acidified emulsions without free silver, we are not disposed to attribute any accelerating or retarding power to the acid, nor have we ever found any increase of density in emulsions so treated.

We now come to another class of modifying causes which we consider purely mechanical, and by means of which any degree of granularity may be given to the emulsion, though their practical application is very limited. If the theory we are discussing is to hold good in its entirety it should apply no less to the variations produced by mechanical means than to those we have already detailed; but, as we shall proceed to show, such is not the case. The nature of the physical changes brought about by mechanical means are almost identical in all the cases we shall notice, nor is there any practical difference in the results obtained with the modified emulsions. We may, therefore, class them together and treat the whole in a general way.

We cannot possibly enumerate the whole of the modifications which may be introduced into the manipulations with a view of influencing the nature of the deposited bromide. The following list will sufficiently explain the class of causes we consider mechanical:—First, the strength of the solvents; second, the strength of salting; third, proportion of solvents; and, fourth, manner of adding the silver in sensitising. In all these cases the effect produced is due to the mechanical action of the collodion upon the formation of the silver bromide, and to its power of holding it in suspension when formed. By decreasing the power of suspension, or by increasing the quantity of bromide contained in the emulsion, we produce a precipitate more or less granular, and it is noticeable that the increase of granularity is invariably accompanied by a lowering of the transmitted colour of the emulsion and film. The effect of these variations upon the working qualities of the emulsion may be stated in a very few words. Given an emulsion containing bromide in as fine a state of division it is possible to attain by the means adopted, in no case is it possible, by modifying the conditions so as to produce a coarser deposit, to obtain any advantage as regards sensitiveness; and in proportion as the coarseness of the film is increased so does the character of the image deteriorate without the slightest counterbalancing gain, until a point is reached at which the emulsion ceases to be of use.

In conclusion: we cannot avoid the inference that the existence of a direct relationship between the state of aggregation of the molecules of silver bromide in an emulsion with its sensitiveness is "not proven," though circumstances would, to some extent, warrant the belief. The true state of the case appears to be that certain conditions favourable to sensitiveness tend also to the production of a comparatively coarse film, but whether there is any connection between the two the complexity of the reactions involved prevents our determining. That coarseness, *per se*, is not productive of sensitiveness is fully proved by the behaviour of films in which the granularity is obtained by mechanical means, but beyond that our present knowledge does not permit us to venture.

WEAKENING OF THE BATH BY USE.

To treat of this well-worn subject—the bath—requires, nowadays, almost an apology; it is so trite and apparently open to no treatment beyond a *réchauffé* of old ideas and principles. We, however, do not intend to apologise nor to present old facts dressed out in new disguises; we intend to strike at the root of one of the most favoured delusions of the day, and with a result which may surprise many. No doubt there does exist a number of delusions with regard to particulars of everyday practice which would take a long time to banish, and some, like what we are today about to treat of, are so wrapped up with daily routine as to require the utmost certainty of conviction of the correctness of other views before attempting the supercession of the old.

If there be one point more than another insisted upon in wet collodion work it is the necessity for repeatedly strengthening the silver bath as it gets worn out by the dipping in it of numbers of plates; in fact, it is one great argument in favour of emulsion processes that in them there is not any danger of that constant fluctuation and alteration in strength which is always alleged to happen with bath processes.

Now we cannot but admit that every show of probability is in favour of the assumption, and at first sight nothing would appear more likely to be true; yet we unhesitatingly state that, although there is a substratum of truth at the bottom of this popular belief, it is yet so exaggerated as practically to make it worthless as a foundation for practice. This is so revolutionary a statement that we at once proceed to test its validity. Let us first investigate the grounds of the belief. First and foremost we shall be told to "examine the bath with the argentometer after a hard day's work, and it will at once show a considerable reduction in strength." To a certain extent this is correct; but what is the kind of argentometer to be found, in nineteen out of every twenty large establishments, but the floating or specific gravity-meter?—a useless toy for this particular purpose, no other but the precipitating argentometer being of the slightest value, though for the printing bath the former instrument may be almost wholly relied upon.

A very slight consideration will show that as plate after plate is immersed the bath becomes so diluted and mixed with liquids of a specific gravity far below that of water that any test relying upon alterations of specific gravity is purely delusive, when the actual alterations in gravity caused by the small proportion present of metallic salt, heavy though it be, are so comparatively slight. It was only the other day we had a bath to examine that registered with the floating argentometer twenty-two and a-half grains to the ounce—a most unworkable strength. Upon testing it, however, by the only exact method, precipitation, it was revealed to us that it really contained thirty-three grains to the ounce; and always with a well-used bath which had not been put aside under conditions favourable to evaporation would such discrepancy exist between the indications of the two instruments. The next reason given would be considered conclusive—that, as all the iodide of silver of the film came out of the bath by decomposition, the bath must be weakened to that extent. And this is precisely true, but—and here is the gist of the matter—what is that extent? We say that the amount withdrawn is so small that in all except the largest establishments where the bath is in daily work it may be practically disregarded, and in those large establishments it would be possible entirely to ignore the reduction in strength without much evil resulting. But, in order that our assertions may carry more weight, we will calculate the changes undergone and show actual possibilities in figures.

First, however, we would call attention to one phase of the argument. It may be said that, although the amount withdrawn by each plate is small, it would be possible by using a large number of plates to weaken the bath to any given extent. This is the error underlying all. It assumes that the quantity of the material operated upon remains constant; but such, we need scarcely point out, is far from being the case, as the nitrate of silver account would show in studios where negatives are produced in quantity. The bath diminishes in quantity as it is reduced in strength, and the bulk of it is used up before a great reduction in strength is shown.

If our readers will refer to our ALMANAC they will find a table giving the amount of any one chemical decomposed by another. We extract the following for our purpose:—Nitrate of silver, 170; iodide of cadmium, 366; bromide of cadmium, 272; iodide of ammonium, 145; bromide of ammonium, 98. These latter four are the ingredients most likely to be found in an average collodion; and, to take a typical one, let us say it has four and a-half grains of iodides and one and a-half of bromides to the ounce, composed in equal weights of cadmium and ammonium. If, then, we multiply the equivalent number of each salt as above given by the number of grains per ounce it contained in the collodion, and divide by the total number of grains, it will give the decomposing power of the iodising salts as a whole. Thus we have—

$$\frac{(98 \times \frac{3}{4}) + (145 \times 2\frac{1}{4}) + (366 \times 2\frac{1}{4}) + (272 \times \frac{3}{4})}{6} = 238.$$

That is, 238 parts of salts in collodion will be required to decompose 170 parts of nitrate of silver. We believe we are beyond the mark if we say that by the time three pints of collodion are used up—*i.e.*, sixty ounces—they would have diminished the bulk of a bath by forty ounces. Let us, then, see what amount of silver would be withdrawn by precipitation alone by three pints of collodion capable, perhaps, of coating from four to five hundred plates $7\frac{1}{4} \times 4\frac{1}{2}$.

Taking the figures obtained we get $\frac{60 \times 6 \times 170}{238} = 257$ about.

That is, three pints of collodion will rob a bath of less than half an ounce troy of nitrate of silver. Let us assume the bath is half a gallon to begin with; if, then, all this silver were taken out at once, it would reduce its strength three and a-quarter grains per ounce. But each plate withdraws a portion of bath, so that the weakening increases in proportion with each plate put in. If, however, a half-gallon bath were worked down to one-half, we think that it would, in the majority of cases, be considered to have done good duty. Let us see what the strength would be in the hypothetical case of the whole of this 257 grains being taken out of forty ounces of bath. Its strength would be then reduced only six and a-half grains per ounce. If we then take the mean of the two numbers—three and a-quarter and six and a-half—we get four grains and seven-eighths as the utmost possible amount a bath could be reduced in strength, even if a half-gallon bath were worked down to one-half.

Need we say that this represents a quantity infinitely below what the usual recommendations and statements would lead us to infer, and to this extent it may be considered that all modern practice in this direction in the use of the bath, so far as is published, is founded in error. We may return to the subject upon another occasion.

THE many uses to which gelatine, albumen, dextrine, and kindred substances are now applied in photography, render it specially important at this season of the year that some ready means should be available for preserving them in solution for a considerable period without fear of putrefaction setting in. A great number of substances exist which are capable of exercising this preservative effect; but it is necessary, in addition, that the material employed shall be as nearly as possible free from any counterbalancing, deleterious action, and this fact considerably reduces the number available. The substance most generally employed is carbolic acid, and recently a new substance, salicylic acid, has been recommended for the same purpose. Either of these may be used, and, owing to their powerful antiseptic action, the quantity necessary to arrest putrefaction is so small that it will not be found to interfere in the slightest degree with the general properties of the solution to be preserved. During the last few weeks we have had an opportunity of testing comparatively the efficiency of both in preserving solutions of gelatine and albumen under conditions which are calculated to try their capabilities to the fullest extent. A solution of albumen intended for use as a substratum was divided into two portions, to one of which we added a little carbolic acid dissolved in glycerine, which we keep ready prepared for such purposes; the other received an addition of salicylic acid. The quantity of carbolic acid employed would amount to about one-tenth of a grain of the pure acid in ten ounces of the dilute albumen, while half-a-grain of salicylic acid was used for the same quantity. The portion treated with salicylic acid formed a rather opalescent solution, which deposited a light powdery precipitate when allowed to stand for a few days; filtered and allowed to rest the precipitate continued to be formed, but otherwise the solution remained sweet and good for upwards of a month of hot weather, when it began to show signs of putrescence. The other portion after filtration remained bright and clear, with the exception of a very slight flocculent matter which was formed, and is now, after a lapse of nearly two months, as good as ever. Carbolic acid would thus appear to bear the palm for efficiency. With albumen solution intended for preservative purposes salicylic acid would perhaps be preferable, as it would exercise the function of an organifier as well as an antiseptic. With gelatine the respective behaviour of the two substances is somewhat similar in character, the carbolic being the more energetic—at least when used in the proportions given above. With a stronger addition of salicylic acid (about half-a-grain to the ounce) we have previously been enabled to preserve a gelatine emulsion in good working order for many days even in hot weather, but eventually it appears to succumb to some decomposing action, which destroys the photographic properties of the emulsion, without exhibiting any signs of putrefaction. The effects produced by ammonia, acetic, and nitric acids are comparatively so feeble that those substances may be considered as practically useless where it is desired to preserve a solution for more than a day or two in very hot weather, though they may be found to answer sufficiently well in winter.

PRACTICAL DETAILS OF CARBON PRINTING BY "SINGLE TRANSFER."

THE publication of the series of articles on *Single Transfer* in the recent numbers of THE BRITISH JOURNAL OF PHOTOGRAPHY cannot but fix the attention of photographers—amateur as well as professional—upon this most simple method of printing in carbon. But, excellent as were those articles, many points of detail were, perhaps, not sufficiently described to ensure successful practice by those who have not had, at all events, some small experience in the manipulations required. As a few remarks, then, from one who has practised this mode of printing for a good many years may not be unacceptable to many of the readers of this Journal, I propose, with your permission, to describe in detail the operations of single transfer printing; and, though to many they may savour too much of an "ofttold tale," I trust they may not be altogether useless.

As to the comparative merits of single and double transfer, it is not my intention to enter into any controversy at the present moment. Without disparaging in any way the beauties of a double transfer print, it is sufficient for me to say that it is to *single* transfer I think we ought to look for the future of carbon printing. By this means the pictures are obtained direct upon the surface on which they definitely remain; and the development taking place upon the substance itself, we are certain that absolute adhesion has taken place between the surface and the picture, so that we need fear no subsequent separation of them.

With regard to the colour of the pictures each operator must judge for himself; but, having determined upon the tone in which he wishes to produce his pictures, it is well that he should provide himself with a fair stock of the pigmented paper or tissue, to ensure uniformity, not only of colour, but in the matter of exposure and subsequent treatment.

The first thing to be done is to render the tissue sensitive. For this purpose, as is well known, bichromate of potash is used. This salt, being largely employed in the arts, is one which can be readily obtained through any chemist or drysalter. In the state in which it is sold commercially it is liable to vary in its qualities, some samples containing a considerable quantity of sulphuric acid. It may be purified easily by recrystallisation, a hot solution of the salt depositing a plentiful crop of crystals upon cooling. This need, however, never trouble the photographer, as he can always procure a purified sample if he please at a slightly-enhanced price.

To sensitise the tissue a solution is made of a certain strength, depending a good deal upon the class of negative which has to be printed and upon the temperature of the season. It will be found that a hard and intense negative will require a stronger solution than a feeble and delicate one—a weak negative yielding with a dilute solution a vigorous print, while a stronger solution would give one flat and tame in appearance, and *vice versâ.* It will seldom be necessary to use a stronger solution than three or three and a-half per cent., or one containing half-an-ounce of the salt to a pound *by weight* of water (which will measure, when cold, sixteen fluid ounces). *In very hot weather, or with very weak negatives, even half this amount may be sufficient.*

The solution being poured into a flat dish to the depth of half-an-inch or so, the tissue, having been previously cut to a proper size, is immersed quickly therein, and turned over once or twice so as to ensure its being perfectly and evenly wetted with the solution, any bubbles of air attaching themselves to the surface, either back or front, being removed by slight friction with the fingers or a soft brush or pledget of cotton wool. It is then allowed to remain for a short space of time till it has become limp and pliable (thirty or forty seconds being frequently sufficient, though in cold weather a couple of minutes may not be too much), then taken out and suspended to dry.

To facilitate this drying it may be laid, pigmented side down, on a sheet of clean glass somewhat larger than itself, a soft squeegee passed gently with a single sweep over the back, removing thus any considerable excess of the liquid, and then removed from the glass plate and attached by pins or clips to a thin lath, or the edge of a shelf in the drying-room. While drying the sheet of tissue should be kept stretched smoothly, otherwise it will, when dry, become cockled, so that it will not lie flat upon the negative.

When the sheets of tissue to be prepared are of considerable size a somewhat different procedure must be adopted, and a room must be prepared with some care for the purpose. A number of *thin* deal laths about three-quarters of an inch or an inch in width must be provided, and of sufficient length to rest upon the two sides of the sensitising trough. To keep these laths in good condition, and to facilitate the removal of the tissue from them when dry, they should be varnished with one or two coatings of shellac varnish, and, when thoroughly dry, rubbed over slightly with a piece of "cocoa butter," which may be evenly spread upon them, and any excess removed by pretty smart rubbing with a linen rag. Without this previous preparation the tissue would adhere so tenaciously to them that it could not be removed without cutting it away, in which operation it would be likely to become broken or cracked, while from the previously-greased laths it separates readily, and the laths themselves are immediately ready for further use. They will require no further treatment for some time, when another rub with a greasy rag and a little cocoa butter will make them as good as ever.

The drying-room should be furnished with horizontal bars placed sufficiently high to allow the operator to pass under without striking his head against them. They should have vertical notches cut in them at intervals of four or five inches, wide enough to hold *easily* two of the laths above mentioned, and should be fixed sufficiently far apart to support the laths without danger of falling. The trough may be made of stout zinc or tinned iron—for large sheets giving the former the preference, as the bottom can be made flatter, securing uniformity in the depth of the solution, and it should have a rod or tube of glass securely fixed along the end from which the paper will be withdrawn.

The sheet of paper, cut of such a size as to move about readily in the trough without catching the edges against the side, is plunged boldly into the solution, which should be nearly an inch in depth, turned over once or twice, the air-bubbles being removed as before noted, and allowed to remain till pliable, with its *face downwards.* Two of the laths referred to are then placed across the end of the trough near to the glass rod. As soon as the paper is deemed ready it is immediately seized with the finger and thumb of each hand, and the end of the sheet placed upon one of the laths, the other being placed on the other side of the paper, and the whole gripped with a couple of American paper clips. There is now little fear of the paper tearing, so that it may be slid along the bath, drawing the gelatinised face of the paper over the glass rod, to which it will *not adhere* if the rod has been wetted. In this way much of the excess of solution is removed from the face of the tissue, and any air-bubbles which may have escaped notice during the immersion of the sheet will be removed. The laths are then slipped into two of the grooves cut to receive them in the horizontal bars. These must be kept edge uppermost; for, if they are allowed to incline, the paper would probably bend them by its own weight, and the sheet of paper would not dry flat, so causing some trouble in printing. A *third* lath is then placed *behind* the sheet of wet paper, as close as possible to the others, and gently passed downward, scraping the excess of liquid from the *back* of the paper, and is then fixed by a couple more American clips to the bottom of the sheet. In this way sheets of paper four or five feet long may be prepared and hung to dry perfectly flat in the course of a few minutes.

The bath of bichromate should be covered up when not in use, and before using it again the surface must be cleared by passing a fold of blotting-paper over the surface. The solution of bichromate must not be used more than two or three times, especially if any interval of time should elapse between the time of using, as a decomposition of the bichromate is caused by the reducing action of the organic matter introduced into the bath upon the salt in question; but as the value of the article is so small economy in its use is not necessary.

It is a curious fact that, although paper thus prepared is much more sensitive to light than ordinary silvered paper, this sensitiveness is not exhibited till it has become dry; it may, therefore, be sensitised in broad daylight, though it is perhaps well to exercise some caution in this respect. It seems somewhat an anomaly, but it is nevertheless true, that sensitised tissue, when *very dry*, is not so sensitive as when it contains a certain amount of moisture, so that in very dry or frosty weather it is not so sensitive as when the air is slightly damp.

While drying, it is needless to say, the room must be darkened or lighted with a yellow light only, and the room should be as large and well-ventilated as possible. The tissue should dry in from six to eight hours; that sensitised over-night ought to be perfectly dry in the morning, when it should be taken down and placed in a tin box for preservation.

During the operation of drying the quality of the tissue may be judged from the character it exhibits. If, for instance, after having been suspended for a quarter or half-an-hour the surface be tacky and adhesive, either the room is too hot or the gelatine of which the tissue is composed has been too strongly heated during its preparation, and a reticulation of the surface, or rottenness of the film, may be looked for during development; but if, on the other hand, it will bear a certain pressure between the thumb and finger, or will allow the finger to pass over the surface without disturbing the continuity of the coating, all is going on well and good results may be expected.

The addition of a few drops of liquid ammonia or a few grains of carbonate of ammonia to the solution of bichromate is often an improvement, as it facilitates the keeping of the tissue in good condition, though if the bichromate be perfectly pure it is hardly requisite.

It should be borne in mind that the surface of tissue as usually met with is not so smooth, nor is the material itself as pliant, as albumenised paper, and therefore it has sometimes been remarked that prints obtained from tissue have not been so *sharp* as those on albumenised paper; but, by adopting the following modification of the method of sensitising, the surface may be obtained as smooth and even as that of glass:—

Sheets of glass about one inch larger each way than the sheets of tissue to be prepared are cleaned, and the surface polished with a cloth dusted with talc or French chalk, and any loose particles brushed off with a broad camel's-hair brush. The tissue, then, on being taken out of the solution, is laid, face downwards, upon the polished side of the glass and the squeegee applied as previously noted. Instead, however, of removing the sheet of tissue, it is allowed to remain attached to the glass till *perfectly dry*. If, then, the point of a penknife be placed under one corner, the whole sheet may be removed with a perfectly smooth and even surface. Pigmented paper thus treated is well adapted for printing small pictures, such as *cartes de visite* or miniatures for colouring, the smooth surface coming in closer contact with the negative than the surface of tissue dried in the ordinary way, and thereby yielding a sharper and more brilliant impression.

We next proceed to the exposure of the tissue in the printing-frame, but this will form a suitable subject for another article.

John A. Spencer.

EDGING DRY-PLATE FILMS.—WASHED EMULSIONS.—GREEN LIGHT.

In the last number of this Journal the "Peripatetic Photographer" calls attention to a very simple and most effective method for edging dry plates with varnish or other fluid. I have used it constantly for the last ten years. My plan is to firmly tie a small strip of wood to the side of a camel's-hair brush, allowing the wood to project about an eighth of an inch beyond the hair, and then to keep the brush constantly in the solution which is to be used. For edging either wet or dry plates before coating with collodion I always use a two-grain solution of rubber in chloroform. For edging dry plates previous to development nothing beats a solution of pure paraffine wax. Either ether or benzole may be the solvent. I generally use the latter, and add a little rubber to the solution. About two grains of each—paraffine and india-rubber—to one ounce of purest benzole is a useful proportion.

The great advantage of this solution is that it is easily applied, dries in a few seconds, holds the film firmly, and keeps the developer from running off the plate. It is when one comes to the varnishing of the negative that the great superiority of paraffine over shallac (which is often used for this purpose) is discovered. The shellac is soluble in the varnish, and is apt to form nasty streaks round the edges, whilst the paraffine is entirely unaffected.

The only trifling drawback to the solution I am recommending is that it makes it slightly more difficult to remove the film from spoilt plates. When I find an edging of film left on the plate after its treatment with soda or acid, I merely sprinkle a little tripoli on a bit of cloth and rub it off with that. If the cloth be folded over the edge of the plate, no other part except where the film is need be touched by the tripoli.

The best bottles to hold the solution of rubber and chloroform or the paraffine and benzole, and the brush, are gum bottles with glass caps. These bottles are so made that when the cap is on there can be no evaporation, and the top of the bottle itself is turned over inwards, so that by drawing the brush against this inverted edge all superfluity of solution is discharged from it. This form of bottle has another advantage. Should it be knocked over when the cap is off the solution does not run out, provided (of course) there is not very much in the bottle at the time. The principle is the same as seen in a very useful form of inkstand, which can be rolled about without upsetting the ink. But even this ingenious and most useful dodge, as applied to the gum bottle, has its disadvantage, and that is that it is difficult to entirely empty the bottle in the ordinary way. However, for the purpose under notice this does not matter at all, as each bottle is kept entirely for its own special solution.

I have written at once to recommend to others what I have so long used with satisfaction myself, as the tallow-candle dodge seems to me a filthy atrocity.

It has just occurred to me that when the negative film is to be transferred from the glass to gelatine or paper a moderately-strong solution of rubber in chloroform would be better than the paraffine—say five grains to the ounce. As nothing will stick to paraffine there would be a difficulty in transferring the whole of the film; the edging must be sacrificed. But as this edging will have no image on it, it would not so much matter, except that in transferred negatives I always like to have a "margin."

Turning to quite another subject: I cannot let another day go by without publicly recording a personal vote of thanks to Mr. W. B. Bolton for the suggestions contained in his article *On a New Method of Preparing a Washed Emulsion*, which appeared in the last number. The idea of forming the sensitive pellicle in the way proposed by Mr. Bolton seems to me not only sound in theory but likely to be most useful in practice.

During the present year I have been working, when my health would permit, at washed emulsions, in the hope of getting a really reliable and extra-sensitive emulsion, and up to this date my greatest successes have been with a bromo-iodised emulsion washed by precipitation. I am impatient to try Mr. Bolton's new method; and, although I really cannot wait until the appearance of the next number to make some experiments with it, I shall anxiously await Mr. Bolton's promised formulæ.

I have some further experiments to make before I can send my notes on transparent spots in washed emulsion, and must crave the indulgence of the readers of The British Journal of Photography if there should be some little delay in the matter. I am only just recovering from a serious attack of intense rheumatic inflammation of the eye, and consequently my work gets on much more slowly than I could desire, particularly as I cannot at present bear a strong light. In working in my dark room I find great comfort from covering the yellow glass with a green blind. This produces a neutral-tinted light, which is most agreeable to work in.

I made the discovery that a green blind over orange-coloured glass gave a kind of non-actinic white light in the dark room some seven years ago, when I first came to Torquay, and many and many a time have intended sending a note of the fact to the journals for the benefit of others, but have hesitated, thinking I would inquire a little more into the matter before publishing anything about it; and so time has slipped on, and the fact remained unrecorded.

Was it not Dr. Vogel who, a year or so back, was much laughed at for announcing he had discovered that the superposition of green and orange glass produced white light? Be that as it may, I would strongly advise all who find the orange light of the dark room trying to their eyes to carefully test the effect of using some green material over the yellow.

Henry Cooper.

ALKALINE DEVELOPMENT.

In alkaline developers the presence of nitrate of silver is not only unnecessary but positively detrimental. This method, generally employed in the dry processes and under some conditions for wet plates, answers admirably for emulsion and bromised collodion.

So far as chemical research has been brought to bear upon the theory of alkaline development, that theory has been found to be highly satisfactory; but the investigation has not yet been carried very far.

It is easily shown that the alkaline salts exert an oxidising action; ammonia acts on the bromide and transforms part of the bromide into oxybromide, which enters into combination and forms a double salt. This prevents the fogging which always results from the contact of iodide of silver with alkaline salts. The contact transforms the film into oxyiodide of silver, resembling that produced by the action of light, and which, in consequence, becomes black under the influence of the developer.

This effect becomes more evident in the case of a very long exposure when bromo-iodide is used. The bromine, which has less affinity for oxygen than iodine, separates from the oxybromide and spreads upon the glass a grey tint, designated by the name of "solarisation." The alkaline salt exerts an action on the oxyiodide of silver produced by the chemical action of light, and transforms it into pure oxide. The iodine displaced enables the developer to decompose the oxide by absorbing the oxygen and leaving a metallic deposit. The action is continued until the total reduction of the oxyiodide, resulting from the chemical action of the light.

The alkaline developer is much more energetic and more powerful than the acid developer. Its utility in the dry processes cannot be over-estimated, inasmuch as it very materially shortens the exposure. The bromide in the alkaline developer is invaluable; it occupies exactly the same position that acetic acid does in the ordinary acid developer. It can be used in greater quantity when the developer is heated and when the exposure has been prolonged, and in less quantity when used cold and the exposure short. It is the bromide which gives cleanness to the proofs and prevents fogging.

In the alkaline development I have replaced, with great advantage, pure ammonia, the carbonate of ammonia, saccharate of lime, and potash, by glucoside of ammonium. I use it in the same manner as ammonia—that is to say, to the extent of a few drops in the developer; and with it I obtain great intensity and vigour, and also regularity in the development of the image with the preparation mentioned afterwards.

Ammonia should still be used with the developer in order to give vigour to the details. The results thus obtained are very remarkable. In this case it is always advisable to add, at the same time as the glucoside of ammonium, a few drops of a bromide solution—that which I prefer being the bromide of ammonium.

I prepare the glucoside of ammonium in the following manner:—In three and a-half ounces of liquid ammonia dissolve two and a-half drachms of glucose (grape sugar), and allow it to repose for a few hours, after which filter and add three and a-half ounces of water; then again filter, and preserve the liquid in a stoppered bottle. It does not appear to undergo any change whatever by keeping.

—Le Moniteur de la Photographie. ERNEST BOIVIN.

A FURTHER ATTEMPT TO SYSTEMATISE EMULSIONS.

THE fact pointed out by the Editors that all the silver bromide is not reduced so easily in the opaque and more rapid emulsion films as is the case with the more transparent kind, seems to indicate that only those portions of bromide which have been chemically or otherwise changed by light are reduced by the developer.

I say this even after the evidence Captain Abney has given us of a supplementary film being reduced when in contact with an exposed film. I evade the application of this fact to the explanation of the behaviour of the ordinary film in this way: Captain Abney superimposed the unexposed film on the exposed film; as far as I am aware, he never inverted this order.

I believe it is necessary that the parts acted on by light, or by the developer thereafter, should be *under*, not over, the unexposed film. If this were otherwise, how should we account for the unreduced bromide you have discovered in the opaque film after a full development? My belief is that in our ordinary work we are indebted almost entirely to the action of light alone for the reduction of the bromide down to the bare glass.

Applying this to the case of the opaque film, we can understand, as the Editors suggest, that the bromide, by reason of the conglomeration of its particles, can be acted upon easily by the light at the surface only, or, as suggested, the "exterior particles" of each group only can come in contact with the light. This latter hypothesis very probably explains the facts of the case, and accounts for the thin, weak appearance of the fixed image; for some of the opaque particles of bromide may be dissolved by the fixing solution at regular, or, more likely, irregular, stages throughout the thickness of the film, thus leaving the same in a similar state as regards light as filtering paper as regards a liquid.

I am surprised to read that the Editors are of opinion that gelatine emulsion is a "standing contradiction" to our stating any general rule as to the influence of the state of division of the particles of bromide on the working of an emulsion. I cannot follow them in saying that "the finest possible division is accompanied by sensitiveness and difficulty in obtaining density." It is true that a fine film may not give an opaque sky on development; but all the bromide can be reduced, the result being an image of ample density for printing, but, at the same time, transparent and rich in colour, just as the bromide was transparent and rich in colour by transmitted light, though often a dense black is obtained. We have none of those cold, grey films which only "riddle" the light without analysing it.

Again: I find insensitiveness to be the characteristic of the finest gelatine emulsions, especially of the red sort. *Apropos* of colour, I understand that Captain Abney intends shortly to publish some investigations on this subject, his description of one of the results of which I will not here anticipate.

I will now state how I account for an opaque film being more sensitive than a transparent one. In the case of a transparent film the particles of bromide are very intimately mixed with the pyroxyline or gelatine, as the case may be, the result being that these latter exercise a restraining influence over the former, so that feeble portions of detail are brought out only after a prolonged development, and, perhaps, not then, for the feeble action of light is easily overcome by the destroying action of free bromide, which continually accumulates during the development, adding to that generally used with the alkaline developer.*

It is thus that a fine film will bear, and even require, a long development, while a coarser film yields a full image very soon after the application of the developer, and is not benefited by a long development.

I wish to call the attention of your readers to the following peculiarity of, at least, some emulsions, giving a thin, "metallic" image when viewed by transmitted light, before fixing. In this state, looking at the image and through it, one thinks it is about as flat and uninviting as one could well see. The high lights are grey and very transparent, and the bromide, being opaque, adds to this effect; and altogether the negative is voted not worth its "fixing salt." If this negative be treated to a wash of that "salt" of which it seems unworthy, "a change" comes over—not "the spirit"—but the "*body*" of the silver constituting the image, and instead of the grey, transparent deposit we have a richer and more opaque image, which may yield good prints. I cannot account for this. I use a one-to-eight solution of hyposulphite of soda, and pour only a ltttle on the film.

One of the troubles from which gelatine emulsions seem particularly exempt is that of the necessity for perfectly-clean plates. With the washed collodion process I have been much troubled lately by plates which show marks of chemical or, perhaps—if I may use the term—"mechanical" impurity on the developed image. There is a plate in my plate-box, coated a few days ago, and which I went to considerable trouble to clean; yet now, on examining it in the dark room, I find it spoilt by well-marked smears and stains, though of their nature and of the cause of their appearance before development I am quite unaware. A substratum of gelatine, unless very evenly applied—and this seems rather difficult to accomplish with my present alcoholic solution—results in markings, the bromide not being reduced to the same extent where the gelatine has thickened. India-rubber I do not like; if the plates can be well cleaned an edging of gelatine is better than anything else.

I consider the difficulty in cleaning plates is of much greater importance than either their weight or their liability to fracture. One is very liable to shirk the filtering of an india-rubber solution after coating each plate or so; the consequence is that the plates coated have generally more specks on them than those prepared with any other substratum where water or alcohol is the solvent used. Besides this, I have always suspected that the emulsion takes up a portion of the rubber, making the film more impermeable to the developer, unless benzole be used with the alcohol for moistening the plate.

What I want is a not too volatile solution, which will dry equally over the film and which can be applied to a *dry* plate, as this method appears to me superior to that of coating the plates while wet. I have also a grave suspicion that a substratum is not a preventive of the action arising from all kinds of stains on glass.

HERBERT B. BERKELEY.

TYPOGRAPHIC ENGRAVING.

I FIRST of all make a negative from a positive, either on paper or glass, and retouch by my process, and interpose close to the sensitive film a glass plate on which has been dusted very finely-powdered plumbago. The result of this is a negative pierced with numberless holes in the black and half-tints.

I obtain from this negative a positive on metal either by the bitumen or fatty-ink process, by transferring to the metal a print on autographic paper by means of engravers' ink or varnish. This positive will exactly reproduce the holes in the negative; by placing this proof upon metal, and applying acid, a metallic plate is obtained that can be used in the printing-press.

This method is employed to make, on lithographic stones, transfers by fatty inks—prints obtained on gelatine from negatives having all the half-tones. It is a difficult matter to transfer this kind of print on to stone on account of the absence of grain of any description in the photograph.

The fine half-tones will not adhere, and are easily detached by the roller, especially around the high lights, the result being anything but satisfactory.

Seal Engraving.—The process which I am about to describe is one which I have used for about five years for making seals and such like for embossing note paper.

I obtain a positive on glass with a powdery pyroxyline, to which it is necessary to add a few drops of castor oil, this addition being to impart flexibility. I remove the collodion from the glass in lines in the high half-tones with a steel point. With a fine brush and Indian ink I draw, in a style contrary to what is usually done for the black lines in the whites of the image, so as to make a *facsimile* of wood engraving.

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* The ammonia, if used for alkali, also evaporates during a longer development.

In order to do this with greater nicety it is better to operate upon a somewhat large positive, and then reduce it to the dimensions required far the seal. From this negative I make a positive on metal by means of the bitumen process, the half-tones of which are carried off at the time of developing, so that nothing remains in the whites but the fine lines previously drawn with Indian ink. The metal is then ready for finishing by means of acid or by the graver.

This process will be very useful in chromolithography in allowing the transfer of a photographic print of an initial letter upon stone. —*Le Moniteur de la Photographie.* M. DESPAQUIS.

NOTES FROM THE NORTH.

WHILE not in the slightest degree under-estimating the value of the research that has so long and earnestly been made into the nature and properties of emulsions, with a view to combine the greatest rapidity with ease in producing sufficient density, I think it should be more generally remembered than it seems to be that there is a very close connection between density and development.

The following extract from a letter just received from a friend, who has long been a careful worker and ardent experimenter with emulsions, may, perhaps, be of use to many of the readers of the Journal. He writes :—

> "You know the difficulty that I have always experienced in getting sufficient density on rapid emulsion plates, especially those of my own preparation, and that altogether irrespective of which of the various modifications I used. Neither, so far as I could see, could any assistance be got from varying the proportions of the constituents of the developer so long as ammonia was employed, and I have used it both as caustic and carbonate, and of all strengths—from a nearly-saturated solution, as recommended by Colonel Stuart Wortley, down to one containing a mere trace of the alkali. Now, I am glad to say, I have got over the difficulty, as the enclosed print and negative from which it was printed will show. The latter has got slightly injured in its removal from the glass, but you will see that if it has a fault at all it is in a leaning to the side of density. The happy result has been attained by abandoning altogether the use of ammonia, and using soda instead. Knowing my scepticism generally regarding communications from across the water, you will be surprised that I owe my present success to the formula of Mr. H. J. Newton, published in THE BRITISH JOURNAL OF PHOTOGRAPHY of June 22nd, page 298. Since I commenced its use several weeks ago I have never had any trouble, the image coming out almost as rapidly as on a wet plate, and acquiring full printing density without any kind of intensification. The enclosed negative received an exposure of ten seconds with a $\frac{f}{14}$ stop, and was developed up to its present state by a single application of the solution. I may add that the "sal. soda" used was the ordinary washing soda of commerce. Please ask our emulsion working friends to try it, and report."

The negative alluded to is 7 × 5, of first-rate quality, very vigorous but full of delicate detail, and the print a charming little "bit"—equal to anything that could be got from a wet collodion negative. From experiments recently made I can fully corroborate the statements of my correspondent, except as regards the rapidity of development. This, in my case, takes perhaps quite as long as the ordinary solutions containing ammonia. There is another feature which the writer of the letter does not notice, but which I consider of much importance. It is too well known that ammonia, especially in its caustic form, has a tendency, when the development is being pushed beyond a certain extent, to dissolve the image, or, rather, reduce it to a thin, feeble state, and at the same time to produce a hazy veil over the whole surface, rendering after-intensification impossible. Now, so far as I can see, the soda solution, even when used much stronger than Mr. Newton recommends, has no such objectionable properties, and may be safely kept on the plate, should under-exposure make it necessary, almost any length of time.

During the continuance of the Highland and Agricultural Society's show, which was recently held in Edinburgh, there were several photographers on the ground ready for any amount of work, but they must have found it an uphill job, in consequence of the immense crowds always surrounding the specially-interesting objects. One of the photographers struck out a good idea in the combination of publicity and convenience. He had hired a cab, which he converted into a convenient dark room or tent by filling the windows with mounted pictures of a large size, the picture side out, of course, except one small pane which was yellowed to admit the necessary amount of light.

Apropos of photography and cattle shows, I was told of an incident which shows that exhibitors are getting alive to the value of photography in a way not at all satisfactory to the photographer. Shortly after the prizes had been awarded, the photographer, thinking not unnaturally that the prize-taker might want the animal photographed, made application for the job, and although willing to take it on very reasonable terms was hardly prepared to accept the offer that was made, viz., that instead of being paid for the work he would be required to give one dozen copies for the permission. Such terms might do for a popular preacher, but not for a prize bull.

Mr. Gray, whose efforts to induce photographers to discard wet collodion and the bath I noticed some time ago, has apparently found them more conservative than he expected, but is evidently not easily discouraged. He has removed to Dalkeith, a few miles from Edinburgh, where he is arranging a studio and necessary appliances for the demonstration to all who may favour him with a call of the many advantages he is convinced his method possesses over that now generally in use. I wish him all success, as the bath is a bother.

Somebody writing in a recent number of the Journal, which is not at hand, as I write from home, says it takes from eight to ten hours to tone a transparency. Surely there must be a mistake here. If he will work in the way indicated in my article on the subject, which appeared nearly a year ago, he will or ought to be able to do it in as many minutes. I do not remember if I gave an actual formula, but if not, and should the writer still not succeed, I shall gladly do so.

JOHN NICOL, Ph.D.

THE SHOWS AT THE FAIR.

THE LAST PHOTOGRAPHER.

"AND has it come to this? But two small booths left—but two of all our shining show, and these so mean and miserable looking. I'm blowed if it don't look like a prosperous trade dying in rags."

Thus soliloquised a foreign-looking individual from Ireland, who wore a sealskin cap, a velveteen coat, which had been once black, but now 'twas brown and old and wrinkled, showing its fair share of the wear and tear of time, a pair of corded trowsers all white and patchy, a red woollen muffler, and no vest—a perfect get-up for a poacher in a drama. 'Twas early morning, and Jemmy—that was his name—stood up against the railings opposite the booths (or, to be more polite, the travelling studios), gazing with wistful eyes at the only two tents that had ventured to come to the fair, on the ground where in byegone days standing room could not be found for the yearly rush of travelling artists.

As Jemmy stood thus musing, a pale, tall, thin fellow came forth from one of the tents and advanced to his comrade. Seen thus in the morning light he looked fearfully thin. He seemed as if he had shot out too quickly, and never had a spare minute to get any thicker. He was clothed in a rather more subdued fashion than Jemmy. He wore a suit of tweed with all the colour and pattern rubbed out of it.

"And so, Jemmy, it has come to this!" he said, pointing over his shoulder to the tents.

"Just what I was thinking, Kelly. Don't it look a deserted village, eh?"

"No gammon about that, Jemmy. I wonder what sort o' job Goldsmith would make o' this!"

"Who's Goldsmith, lad?"

"Oh! he's a fellow that used to trade in deserted villages. But is it not sad to think our crescent of tents should dwindle down to two? Look you, Jemmy, it will come to one, and then to none at all. I wonder which o' us will be the last man."

"I don't know, Kelly, and I don't care. It ain't worth the fighting over. The shine has gone for ever. There's nothing but a matt surface left. Our chums are all gone their own roads, with their gambols and their songs and their flashes of merriment, as the poet says."

"Yes; it used to be very jolly. I often think of the boys and the times that are gone."

"Why, Kelly, I'm always a-thinking of them. I could almost fancy that I could see Old Bass just now with his wonderful performing birds at night and the follower of Daguerrey through the day. *He* was a heavy man if you like!—twenty stone without his coat! Why, lad! you could show yourself as the living skeleton along side o' him!"

"And to think, Jemmy, that such a ornament to our profession should go away to manage that 'two-headed girl' show. But I suppose it pays better; that's how it is. Thus they leave the temple of art to dwell in the hall of the monstrosity."

"They have all drifted away," said Jemmy, musingly. "There's Old Bones—he's gone into a shooting saloon."

"Yes," Kelly replied with a laugh; "he's the boy that gives them nuts for their money and fun for nothing! I couldn't touch such a business," Kelly added, with a wise shake of the head.

"And Little Jackson," Jemmy continued; "he took to the reading o' heads and telling folks a lot a lies about their genius and talent."

"And he got into a nice mess over that same, Jemmy."

"How was that?"

"He put a man under the 'influence,' as they call it, and I'm blest if he could take him out again. The friends kicked up a row, and so they took Jackson to the office and didn't let him out again for a couple of days. He was brought before a magistrate, and he was bound over to be a good boy and not to do it again for twelve months."

"It serves him right," said Jemmy, with much severity. "He should learn his business better before he begins to be a professor. Now there's Hobbs, who was his partner. He showed sense. He went into boiled peas—a trade easily learned and an article that there's considerable demand for in the market."

"The greatest transformation of all, in my opinion," said Kelly, with a laugh, "is Bandy Bill. He has taken to Pepper's ghost, and spouts poetry as each picture is shown. They say he has turned out quite an elocutionist. But I'll tell you what, Jemmy, when I come across him I must have a private entertainment all to myself, for I'm sure to laugh."

"I'll go with you, Kelly, and pay for a private view; and won't we have fun? Now there's Balls," Jemmy continued. "He's doing well in company with Sir Robert the Bruce and Sir William Wallace in the wax-work line. There is really something artistic in his profession, although Wallace is so much done up that I'm sure he would drop to pieces if they didn't bind him to his sword with twine. Bruce, who is in good preservation, has a perpetual sneer upon his face as he gazes on the dilapidated condition of his friend."

"Butterworth is about the worst case I know," Kelly said, after remaining silent for a minute or two. "He's gone to be clown to a one-horse circus. Now I hold there is no excuse for a man getting so low as that. And Tommy Jones has gone away with the girl that writes and plays the piano with her toes."

"Gone, gone, gone! that's it, lad! All the novelty, and hence the profit, is worn out of it. It has descended to the level of an ordinary miserable trade. Now it is nothing new, and the artist that the people hailed with delight at each fair is really a thing of the past. In every little town they have a little man, and you can get a tintype with as much ease as you can buy a penny roll. No use for us now, lad! The rats showed their good sense in leaving the sinking ship. But, Kelly, what say you? We'll stick to it to the end?"

"All right, Jemmy—I'm on!"

"And so you see, Kelly, one of us must be the last photographer of the fair ground. What they call the 'advance of progress' will trample us down and stamp us out; and those merry, happy, sunny days when we could show whole streets of tents will be amongst the things long past—the curious things that our children will talk over."

"You see, Jemmy, the thing is quite natural like. The boys have left it because it don't pay them. When a thing ceases to pay it dies."

In silence they walked across the road to their tents to prepare plates for the likely impressions of the day. MARK OUTE.

FOREIGN NOTES AND NEWS.

A NEW FIXING MEDIUM.—HERR ADOLPH OTT ON THE CAUSE OF THE RETICULATION OF CARBON PRINTS.—NEW METHOD OF DETECTING POTASH.

AT the last meeting of the Berlin Photographic Society Herr Liebmann showed some prints fixed by a new fixing medium, discovered and applied by Herr Krüger. It is said to contain no sulphur; to leave no bad effects after imperfect washing; and to fix the pictures in about ten minutes, though they may be left in the solution as long as is convenient without being injured. The after-washing need not occupy more than ten minutes, and the whites are brilliant. The silver which goes into the solution is precipitated to the bottom if left standing over night, so that the fixing bath is always ready for use, and only requires to have its strength kept up. It may, moreover, be combined with a gold bath, so that the fixing and toning may be carried on simultaneously. All this promises very fairly, and it would be a good thing if some reliable substitute were found for our old friend "hypo.;" but Herr Liebmann does not tell us the name of the salt that is to work all these wonders, nor has he as yet tried its effects himself. If he be successful in his experiments we shall probably hear more of the new "fixer."

In the current number of the *Photographische Correspondenz* there is an article by Herr Adolph Ott on the cause of reticulation in carbon prints, in which he says that various causes have been assigned for this appearance, as to rapid or to slow drying of the prepared tissue. While some would prevent this by the use of weaker baths, and others by the addition of acid to the developer, he himself is inclined to think that the state of the weather is the principal, though not the sole, agent, double-transfer pictures being much more liable to show reticulation than those produced by the single process. In the establishment of Herren Braun and Co. it was observed that specimens of the same tissue, after a single transfer, examined by a magnifying glass were found quite free from reticulation, while those twice transferred were a good deal affected. This all agrees with the fact observed by Mr. W. B. Woodbury, that the addition of certain pigments to bichromated gelatine calls out a horny, reticulated structure, which shows itself sooner in some kinds of gelatine than in others. In all these cases there seems to be a considerable decrease of the adhesive power. Unless certain special precautions are taken this appearance almost always makes its appearance when the atmosphere is charged with electricity—above all, when a thunder-storm is coming on. Manufacturers of gelatine are well aware that the jelly is easily decomposed when the atmosphere is stormy. He (Herr Ott) believes Herr Ferdinand Braun, of Dornach, was the first to prove, experimentally, that this decomposition of the gelatine solution can be produced at will galvanically. Here, as with other spontaneous decompositions of organic matter, microscopic organisms come into play—at least as far as the unchromated gelatine is concerned—which appear to be energetically called into life through the medium of electricity. The fact here referred to is that well known to every housewife—that milk which becomes sour during a thunder-storm shows chlorophyllose organisms when examined under a microscope, and has been taken advantage of by a Frenchman, who accelerates the fermentation of must by conducting a current of electricity into it.

It being presupposed that the tissue is dried in a moderately-cool apartment, the addition of about one quarter by volume of ten-per-cent. spirits of wine to the chromate bath is very advisable—firstly, because the drying is thereby hastened; and, secondly, because it perhaps acts, like carbolic or salicylic acid, as a preservative.

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Herr Ott, who quotes Vidal, Land, and Friedlein, thinks that the latter has erred in prescribing so large a quantity as four grammes of fluid carbolic or phenylic acid in a bath of 3,200 grammes of distilled water to 120 grammes of bichromate of potassium. Lastly: Herr Ott hopes that in the course of the summer practical carbon printers will industriously make notes of all indications likely to lead to a permanent solution of the knotty question of reticulation.

In the analysis of collodion and other photographic solutions it is desirable to have a suitable and ready mode of detecting potash; this has hitherto been attended with some difficulty owing to the solubility of the simple and double salts. A new method for this has been published by M. Ad. Carnot. Dissolve ten grains of subnitrate of bismuth in a few drops of hydrochloric acid, and in a small quantity of water dissolve twenty grains of hyposulphite of soda. This second solution must be poured into the first named, and a small quantity of alcohol added. If any of this reagent be brought into contact with a solution of potash salt the result will be a yellow precipitate; a marked yellow, however, will be produced if the potash be not in solution. This reaction takes place with all potash salts of mineral acids. With this reagent barium and strontium are sometimes mistaken for potash, as they form white double salts. If a very small quantity of potash be contained in a solution it should be evaporated considerably, even to dryness, in order to more distinctly obtain the necessary reaction. A simpler method, however, is to dip a strip of filter paper into the solution, and, after being allowed to dry, the edges will be found to be of a yellow colour.

Meetings of Societies.

AMATEUR PHOTOGRAPHIC ASSOCIATION.

A COUNCIL meeting of the above Association was held on Tuesday, the 31st ult.,—T. Sopwith, Esq., M.A., F.R.S., &c., in the chair.

The minutes of the last meeting having been read and confirmed, the following members were elected:—H. B. Broadhurst, Esq., and the Rev. W. E. Hancock.

The SECRETARY called the attention of the meeting to the fact that a large number of old prize negatives, which are the property of the Council, were now rarely used for printing purposes, and suggested that it might be well to present them to their previous owners.

After a long discussion it was proposed by Mr. Glaisher, and decided by the meeting, that, as the question was one of considerable importance, it should be postponed for further consideration at the next meeting of the Council. A. J. MELHUISH, *Hon. Sec.*

EDINBURGH PHOTOGRAPHIC SOCIETY.

AN outdoor meeting of this Society was held on Thursday, the 9th inst., the locality selected on this occasion being Aberdour, one of the most picturesque places on the banks of the Forth. The village—itself a favourite watering-place with a quaint old harbour—is flanked both on the east and west with such beautiful combinations of rock, wood, and water as to have long made it a favourite resort by artists both of the brush and camera.

The boat, the "Lord Aberdour," was timed to start at 9.30, by which time the members were on board in the exuberant spirits usual on such occasions when the appearance of the day promises to be favourable to good work; but they were doomed shortly to be damped in more senses than one. Although the atmosphere was bright and clear when they started, before they had got out of the harbour they were enveloped in one of the dense fogs that occasionlly come on, making it impossible to see from one end of the vessel to the other, and condensing in minute globules like hoar frost on the dresses and beards of the passengers. Under such circumstances progress was of course slow, and the almost incessant sounding of the fog whistle, answered occasionally by the faint tinkle of the bells of the vessels in the offing, had a peculiarly weird effect not at all unpleasing, but certainly not pleasant enough to make up for the disappointment likely to be caused by the failure of photographic operations. Happily, however, the fog proved to be of short duration, and when within sight of Aberdour it disappeared as suddenly as it came, revealing a brilliant sun in an almost cloudless sky, and with an atmosphere so still that not a leaf was stirred.

The road from the landing pier winds round the face of the Hawkcraig, and at every turn offers some new and charming "bits" for the camera; but the party pushed on to the harbour, where, in consequence of the tide being sufficiently out, several vessels were grounded, and a number of exposures were made on the most picturesque combinations.

The castle, Hawk-craig, and woods to the east offered some tempting pictures, but it was decided to reserve them for a future excursion and work westward instead; and therefore the party passed through the village, and lunched in the pretty hotel immediately opposite the beautiful gate and entrance to the Donibristle grounds.

After luncheon an ordinary meeting was constituted, Dr. John Nicol in the chair, and some routine business transacted, including the admission of Messrs. W. Bertram and James Robertson as ordinary members.

The drive through the Donibristle grounds is enchantingly beautiful. Wooded almost to the water's edge, the cathedral-aisle-like avenues offer here and there most lovely peeps of Inchcolm, Cramond, and other islands which stud the Forth, and give a variety of which the visitor never tires.

The first halt was made at Dalgety church—a fine old ruin, built in the fourteenth century, and in which lie the remains of many of the Seton family. It stands in a beautiful bay close to the water's edge, and although requiring very wide-angle lenses affords several fine pictures. Here the cameras were set up, and as long exposures were required they were left to look after themselves while some of their owners enjoyed a refreshing swim in the Firth, and others, under the leadership of Mr. Sinclair, extemporised a choir and gave full vent to such music as the surroundings always inspire.

From Dalgety the drive was continued to Donibristle House, which, like most houses of its time, has seen many ups and downs. It was at one period the residence of the Abbots of Inchcolm, and has been three times destroyed by fire, the last time only some dozen years ago. It consists of a centre and two wings, the latter at a considerable distance from the former, and connected with it by underground passages. The centre is a mere shell of crumbling walls, but the wings are still inhabited.

The only thing of interest here—at least of interest to photographers—is a fine example of forged work in the shape of a gate presented by Queen Anne of Denmark. This was photographed from various points, and after enjoying "the soft recumbency of outstretched limbs" on the velvety lawn which dips into the water, the drive was continued across the grounds and out by the north gate. Fordel Castle, with its exquisitely-beautiful garden, was the next object of attention. Under the guidance of Mr. Foulis, who has been for nearly fifty years at once head gardener, factor, and general factotum to the Hendersons of Fordel, the party were first conducted through the extensive gardens and "houses," and then through the beautiful glen leading to the castle—an ancient baronial relic of former times. It is in excellent preservation and contains many curiosities, including some large pieces of tapestry from the old house of Pitreavie. The glory of the place, however, is the ornamental garden, which it would be difficult adequately to describe, and on which the highest possible degree of gardening skill, guided by the purest taste, has been expended.

The remaining plates were exposed here, and the rest of the time spent in examining the castle and listening to the lore connected therewith so humorously retailed by their guide, until the party were obliged to leave in order to catch the last boat, which they did after a hurried tea in the hotel, and arrived safely in Edinburgh about nine o'clock.

We may add that all the plates used were the collodio-bromide emulsion, and the exposures varied from five to forty minutes.

BERLIN PHOTOGRAPHIC SOCIETY.

This Society met on the 15th June, when the chair was taken as usual by the President, Dr. Vogel.

The first business was the reading of letters—one being from Herr Remelé, and another giving an account of the reconstruction of a German photographic society in New York.

The President then said a few words on the recent hailstorm, remarking that the damage done was very unequally distributed. Some studios suffered very severely, having hundreds of broken panes, while others—as those of Herren Loescher and Petsch, Schaarwächter, Halwas, Boll, and Marowsky—had scarcely suffered at all. Herr Hirsch lost 700 panes, Herr Aurisch 225 panes, Herr Schauer 150 panes, and many others smaller numbers.

A discussion followed on the liability of glass insurance companies for these breakages when the broken panes occurred in the roof.

Herr Grüneberger reported on his experiments with Eder's lead intensificator. According to Professor Wartha daylight caused fogging with that method of intensification, by decomposing the ferricyanide of potassium. That, however, did not agree with the results obtained in the Gewerbe Academy studio, where for the last six months it had been the custom to intensify by daylight with the best results. In order to ascertain the facts of the case for himself he exposed two plates, taking the same object, and with the same exposure got both free from fog. One of these he allowed to lie under a lead solution for ten minutes in the full sunshine, while the other was placed in a lead bath and kept in the dark. Both were quite free from fog, and there was absolutely no difference between them, though the lead solution placed in the sun was visibly turbid.

The President then explained that the turbidness was merely on the surface, where, on account of the yellow colour of the solution, the strength of the light passing through it was very perceptibly weakened by absorption, so that a few millimetres under the upper surface a chemical decomposition of the solution was scarcely to be perceived. According to spectral-analytical measurements, taken with Vierordt's apparatus, the actinic power of a ray of light passing through one centimetre of depth of a one-to-sixteen solution of red ferricyanide of potassium was reduced from its original strength by 0·0,000,000,357, and with a layer half a centimetre in depth by 0·0,001,889. If the intensification were then carried on in a vessel in which the plate was covered to a depth of half a centimetre by the fluid, there was nothing to be feared from fogging of the plate through the action of light. That was most likely to occur when the solution was poured over the plate instead of the latter being laid in it.

Herr Schaarwächter said that when he was intensifying with lead a peculiar circumstance occurred. The chromate of lead film sprung up and was torn during the process of drying, while the actual picture film remained uninjured. Occasionally, also, the chromate of lead film moved on the application of varnish.

Herr Schahl had met with similar phenomena.

The President then gave a somewhat lengthy account of experiments made with electric light. He also referred shortly to the blue-light-cure delusion prevalent in America.

The meeting was shortly afterwards adjourned.

Another meeting of the above Society—the last of the season—was held on the 5th July,—Dr. Vogel presiding.

The subjects discussed were the pernicious action of different sorts of fumes on the photographic process; the adulteration of nitrate of silver with lead; the action of sulphuric acid on the silver bath; and a new fixing medium.

The meeting was adjourned shortly afterwards, not to meet again until the 21st September.

VIENNA PHOTOGRAPHIC SOCIETY.

A meeting of this Society was held on the 5th June last,—Dr. Hornig occupying the chair.

The President read a letter from Dr. Vogel relating to the exhibition of graphic art to be opened at Nürnberg on the 2nd September, requesting those who possessed objects likely to prove interesting to send them. Amongst the specially-desirable objects were mentioned:—Martin's first daguerreotype; the first picture taken with Voigtländer's objective, the lines of which had been calculated by Petzval; heliogravures by Pretsch; proofs by Leth; specimens of the work done in the royal and imperial military geographic institutes, &c. He (the President) cordially invited any of the members present who possessed any of these objects to be good enough to send them. He also especially hoped that some of Professor Berres' first experiments in etching daguerreotype plates for the copperplate printing-press, which he understood to be in the hands of a member of the Society, would be amongst those exhibited. He (the President) further said that he had had a communication from Herr J. Maes, of Antwerp, mentioning that the tercentenary of the birth of Reubens is to be celebrated in that city by an exhibition of his works, and that reproductions were desired of those of his paintings which could not be obtained for exhibition. A special wish was expressed for a catalogue of the photographic reproductions of these pictures which are in the Belvedere and Liechtenstein galleries. The President and Herr Löwy then made some observations on the preparations for the Paris International Exhibition and the forthcoming exhibition of the Photographic Society of Great Britain in London.

Professor Wartha's paper on lead intensification was then read. [See The British Journal of Photography for 13th July.]

Dr. Eder said the President had communicated Professor Wartha's remarks to him, and he had immediately set on foot a series of experiments in order to prove the correctness of his analytic *data* and deductions; but he had not yet prepared his statement, which, however, he would do as soon as possible.

Some recently-published books, pictures, and other matters were laid upon the table, after which some local questions were discussed. The question-box was then opened and was found to contain two questions. To the first—"Where are heliographs produced by the carbon process to be met with, and are they satisfactory?"—

The President replied that he understood some had been published by the Association Belge de Photographie in their *Almanac Agenda-Formulaire*, but that as yet he had not seen any very remarkably fine specimens.

The other question asked was whether anyone had used taurin in the preparation of instantaneous dry plates?

The President replied that numbers of substances had been recommended of late as so-called preservatives and sensitisers, or as accelerators, of the intensification process, but that he thought few of them did much good. He also believed that taurin (amido sulphäthylic acid, &c.) was scarcely suited for the purpose.

The meeting was then closed by the President with the wish that the holidays might be profitably employed by the members in the accumulation of interesting materials for the coming session.

Correspondence.

MOIST PLATES.

To the Editors.

Gentlemen,—With respect to Mr. Protheroe's communication in this morning's Journal, in which he requests me to give particulars of the formula employed by me in the preparation of moist plates, I beg to state that at present I am scarcely in a position to do so, as I am now actively engaged with experiments in this direction, which I have scarcely yet completed. I hope, however, to have the pleasure of treating upon the subject at an early date.

I herewith send you a print from the negative for your opinion; it is unmasked and untouched in any way.—I am, yours, &c.,

Reigate, August 10, 1877. W. Brooks.

TRANSPARENT SPOTS IN EMULSION NEGATIVES.

To the Editors.

Gentlemen,—I have never met with transparent spots in washed emulsions when using tannin.

I dissolve thirty-five grains of tannin in an ounce of alcohol, and, before coating the plates, I mix nine parts of emulsion with one part of the tannin solution. The plates keep very well; the film is a little thinner, but developes without spots, and is very clear.

I have used the process of precipitating bromised collodion in aqueous silver solution (as recommended by Mr. W. B. Bolton in your last issue) since May. My proportions are:—

Plain, thick collodion	160	parts.
Double bromide of cadmium and ammonium	7	,,
Water	200	,,
Nitrate of silver	9	,,

I pour the collodion into the silver solution, shake well, and wash the precipitate.—I am, yours, &c., Dr. Liesegang.

Dusseldorf, August 11, 1877.

EDGING DRY PLATES.

To the Editors.

Gentlemen,—In your last number your "Peripatetic" correspondent appeals for some suggestion as to modifying a tallow candle, so as to render it less soft and smeary when used to edge the films of dry plates. As tallow in any form is exceedingly disagreeable to use, not only from its messiness but from its offensive odour, will you allow me to suggest that a much more agreeable substitute will be found in a piece of "cocoa butter?"

This substance, having been introduced into the pharmacopœia, can be obtained from any chemist, and no one who has once tried it will ever revert to the "tallow-candle" expedient again. It is much harder than tallow, so that if a notch be cut in a piece of it—say an eighth of an inch deep—it may be drawn along the edge of the plate with the advantage of thus regulating the extent to which the greasiness shall extend, and the hands are not polluted with the filthiness of the other. The odour is agreeable rather than the reverse, and the presence of a little of the grease upon the hands is no detriment, as it prevents the absorption of the developing solution, and consequent staining of the fingers to a very considerable extent.—I am, yours, &c.,

9, *Gratton-road, West Kensington,* John A. Spencer.
August 14, 1877.

[Since receiving the above we have tried the cocoa butter suggested by Mr. Spencer, and find it to be exceedingly valuable for the purpose of edging dry plates.—Eds.]

DEVELOPERS.

To the Editors.

Gentlemen,—I do not think that "Finem Respice" will like the kind of image produced by saccharate of lime. I have found the image to be thin and poor; this is also the experience of others. Saccharate of ammonia—made by adding a solution of carbonate of ammonia to the saccharate of lime as long as a precipitate of calcic carbonate is formed—was recommended some time after the introduction of the saccharate of lime developer, but this I have not tried.

If "Finem Respice" be not satisfied with the ordinary alkaline developer, let him try the hydrosulphite of soda. Here all is plain sailing. But, if your correspondent be of an experimental turn of mind, there are plenty of developers that "want trying," such as the ferrous oxalate proposed by Mr. M. Carey Lea. If this could be made to work there would be the advantage of only one solution for the developer.

If "Finem Respice" *looks to the end*, as his name denotes, I suppose he will not mind having to surmount some obstacles in order to reach the desired goal.

It may be well here to state that the hydrosulphite solution is a solvent of shellac, so that it is useless to coat a wooden developing-tray with a solution of that substance; better give such a tray a coating with wax or paraffine. I mention this because a flat-bottomed tray is very useful with this developer, and a wooden one can be made to suit any sized plate used, the plate being raised for examination by means of a piece of pack-thread passed underneath it. I am by no means sure that shellac would not prove a valuable addition in some cases to the developer, or, possibly, still better, to the washed emulsion, as I believe it assists the development and density.

I have noticed that the hydrosulphite developer gives off a peculiar smell on the addition of pyro. in alcoholic solution, quite unlike the scent of the alcoholic solution of pyro. alone. Whenever the pyro. solution is added the developer smells strongly for a time, and then the scent goes off.—I am, yours, &c., Herbert B. Berkeley.

Cotheridge Court, Worcester,
August 11, 1877.

DROPPING TUBES.

To the Editors.

Gentlemen,—I observe in your issue of today a notice or report from Professor Stebbing of a dropping apparatus, which I think rather complicated.

I use a little glass tube drawn to a point. I found this in a chemist's shop in Oxford-street, going from near Regent Circus. I was told that they were originally made for some eminent physician or surgeon. They suit any bottle not too deep, and are used by holding it by the thumb and second finger, applying the fore-finger on the top. They are so cheap that I bought a dozen. Of course they can be passed through a cork if desired and sealed all round, as in the case of ammonical or other fugative solutions. I have not seen them anywhere else.

By the way, I should say that I have now in use, after six years' service one of these little tubes, for which I cut to suit a bit of bamboo. This I carry in my pocket.—I am, yours, &c., Thomas Parkyns.

Harnham Cliff, Salisbury, August 10, 1877.

Miscellaneous.

The Great Lick Telescope.—Richard S. Floyd, one of the trustees of the Lick Trust, has just returned from an extended European tour. During his absence he has talked with many scientific men of this and other countries, but almost invariably found them afraid to commit themselves to an opinion as to whether a greater success can be obtained with a reflecting or refracting telescope. Professor Newcombe, of the Observatory in Washington, after his visit to Europe to look into this matter for Mr. Lick, reported warmly in favour of a gigantic refractor, and forwarded estimates as to cost. He has since changed his opinion, however, and now recommends a silver-on-glass reflector of about seven feet diameter. Ross's, Herschel's, and other celebrated telescopes have speculum metallic reflectors, which have until lately been considered the best. Now the palm is claimed for an invention of Leon Foucault's by which silver in solution is deposited on glass. Foucault made a reflector upon this system about thirty-one and one-fifth inches in diameter, and excellent work has been accomplished with it. After his death a reflector upon his plan, about four feet in diameter, was constructed for the observatory. Owing to some not thoroughly explained cause this has not proved a success, and another of the same dimensions is being constructed to replace it. Great interest is manifested in the result of this second experiment, which cannot be proven for a year yet. Dr. Huggins, the well-known astronomer, also favours a large reflector, as it is better for spectroscopic analysis, his favourite study. It is natural that he should prefer a reflector, as he desires to have the field of physical astronomy enlarged. Theoretically, a reflector of four feet in diameter is about equal to a refractor of twenty-six inches. The Ross reflector is six feet in diameter, only four of which are effective, and so far it has not been proved that more than four feet of a reflector can be made effective. The great trouble with the reflector is that it is very sensitive to atmospheric changes, while with the refractor the difficulty lies in the secondary spectrum. The object-glass of the refractor is composed of two glasses joined, the outer being of crown glass, the inner of flint. Rays passing through the crown glass are refracted. The consequence is that perfect achromatism is impossible, and the difficulty of compensating these refractions increases with the size of the object-glass. The largest refractor in the world is that in the Washington Observatory; it is twenty-six inches in diameter, and is an excellent instrument. Mr. Floyd said that, after as careful an examination as he could make, he is inclined to believe that the best interests of the fund will be served to have constructed a larger refractor than any yet made. This ought not to cost complete more than $150,000. Then there will be a subsidiary refractor, about four feet in diameter, supplied with both silver-on-glass and speculum metal mirrors. Such an instrument has been offered, or rather parties have agreed to construct one, for about $20,000. Tell, of Paris, will undertake to make crown and flint glass discs for the object-glass of a forty-inch refractor for about $20,000—stipulating that he shall be allowed two years for construction.—*San Francisco Bulletin.*

ANSWERS TO CORRESPONDENTS.

Photographs Registered—

S. A. Jones, Wrexham.—*Photographs of Models in Cork.*

W. Currey, Bolton.—*Two Portraits of the Right Hon. W. E. Gladstone, M.P.; One Portrait of W. H. Gladstone, M.P.; and Two Groups of W. E. Gladstone and W. H. Gladstone—all in the Costume and with the Surroundings of Woodmen.*

☞ *Correspondents should never write on both sides of the paper.*

Notice.—Each correspondent is required to enclose his name and address although not necessarily for publication. Communications may, when thought desirable, appear under a *nom de plume* as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

W. Weston.—Received. In our next.

A. J. C.—A private reply will be sent in the course of a few days.

Wm. Smith.—It is about ten years since the firm named ceased to exist.

P. D. (Edinburgh).—Discontinue the use of sulphocyanide of ammonium. As we said in an article on this subject a few years ago, it is "a fixing agent that will not fix."

F. R. Garland.—Brunswick black forms a very good black varnish for glass positives; but almost all dealers keep a black varnish prepared specially for this purpose.

J. E. A. N.—Your bath may be made to work correctly by adding a solution of bicarbonate of soda until it is opalescent, placing it in the sun for an hour, and then filtering.

H. R. E.—In making a bath of glass, adopt the precaution of roughening the parts where the union is to be effected, and also of warming it previous to applying the cement.

Obliged Reader.—The lens marked "C" on your list will act much more rapidly than any of the others. This fact will be apparent by comparing its aperture, which is large, to its focus, which is very short.

B. Green.—We are tolerably well acquainted with the town named and with the law of demand and supply existing there in regard to photography; and it is our opinion that the place is already overstocked.

A Victim.—The salt enclosed is nitrate of potash with which there is no nitrate of silver mixed. If you address a note to the chemist from whom it was purchased he will readily rectify the mistake made by the assistant.

A Holborn Circus Man.—A "ray" of light is not the same as a "pencil" of light. By the former is meant the smallest portion of light that can be imagined; whereas, by a "pencil" is understood a collection or assemblage of rays.

W. J. Hodgson.—The portrait enclosed is one in which the use of retouching will be absolutely necessary in order to make it a pleasing and truthful portrait. When touching out the freckles you may, with advantage, also lighten up the right cheek.

Bryce James.—Before the negative bath works properly it will be necessary to add to it fifteen ounces of water. This will reduce the strength of the solution to thirty-five grains to the ounce, which is quite strong enough when used with the collodion you prefer.

Gabriel Molla (Alicante).—A few years ago we published several articles on processes with salts of iron. No work is specially devoted to this branch of photography. The best treatise on the carbon process is the *Manual* published by the Autotype Company, London.

W. N. D.—1. It has been found by experience that lenses of the plano-convex form make the best eyepieces for telescopes. —2. The two lenses nearest to the eye end of the telescope constitute a Huyghenian or negative eyepiece when used alone. Everything examined under such circumstances appears inverted.

Young Ebor.—We occasionally adopt a method by which the magnesium light burns steadily and without a flicker. This light, however, is not to be compared with the lime light as regards general steadiness and utility for lantern purposes. You will find much useful information on the lime light in the two last volumes of The Britsh Journal of Photography.

F. Walker.—Having had the oxygen bag in use for two years you should now obtain another. Very few experienced exhibitors prefer to use a gas-bag having had active employment for two years. It will, at anyrate, be a safe precaution if you keep beside you a new bag always ready to take the place of the old one when the inevitable moment arrives which proves it unfit for further use.

S. Brown.—Cadmium has sometimes been designated "the twin brother of zinc," in the ores of which metal it is found in small quantities. Bromide of zinc is occasionally being made use of in photography, but up to the present time the bromide of ammonium has retained the chief place among the bromides. Iodide of zinc was recommended by us, for use in collodion, about twenty years ago.

Rev. J. S. Scott.—Peroxide of tin for polishing glass may be prepared by making a saturated solution of tin in *aqua regia*, adding water, and then pouring into the solution sufficient diluted ammonia until the whole of the tin has been precipitated. After the precipitated oxide has settled to the bottom decant the fluid, and fill up the vessel with water. Repeat this several times until the oxide is properly washed, after which it must be exposed to heat.

John Simpson, Jun., has several photographs the surfaces of which have become scratched and abraded from friction with each other. He inquires if there be any remedy for such an evil. In reply: one of the most effective methods of treatment consists in smearing the surface with any suitable encaustic paste, such as a solution of wax in turpentine, and then applying gentle friction with a rubber composed of a tuft of wool covered with calico. This will not remove the abrasions, but it will prevent them from being so noticeable as before.

Carlton.—The straight brick wall in the picture is most offensive from an artistic point of view. We advise you to print an enlargement and place it in the hands of an artist, who will entirely remove this eyesore and supply some other feature of a less objectionable nature. For example: the graveyard might be brought to the front of the picture, which would give room for a display of artistic powers. Bear in mind that it is the old church, and not the brick wall or the graveyard, that forms the leading feature in the picture. Hence everything else should be kept in subordination to the church.

B. J. K. writes—"Will you please answer me the following question, namely, whether a collodion transfer, transfered by the process I shall describe, will be liable to crack or peel off? First, I use Winsor and Newton's academy boards and canvas for my enlargements, 24 × 20. I wash the boards with a solution of carbonate of soda until clean water flows freely over the surface. When dry I coat with a warm solution of Nelson's gelatine, and allow it to dry. I take a collodion transparency on glass, and with a sheet of tracing-paper I transfer it to the board or canvas. I only take the head and neck, and sketch in the rest. Can you inform me of any better process, so as to avoid the peeling off should my process prove a failure?"——In reply: the process adopted by "B. J. K.," as described by him, will ensure the perfect adhesion of the collodion film to the boards or canvas.

Received.—W. B. Bolton; "Free Lance." In our next.

☞ **Editorial Communications should be addressed to "THE EDITORS"—Advertisements and Business Letters to "THE PUBLISHER"—at the Offices, 2. York Street, Covent Garden, London, W,C.**

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Royal Cornwall Polytechnic Exhibition.—We learn that among those who will take an active part at this annual display as jurors or otherwise, the name of our correspondent, Mr. William Brooks, has a prominent place. We are glad of this, as dry-plate photography, at anyrate, will have in this gentleman an intelligent arbitrator.

Poikilography.—Under this designation are now being introduced a number of what, at first sight, appear to be oil paintings by the old masters. In the gallery of Messrs. Lombardi and Co., Pall Mall East, are on exhibition a large collection of works reproduced in *facsimile* from the *chef-d'œuvres* in the Dresden Gallery. Concerning the method of their production we have as yet received no information, but the appearance of each is most undoubtedly that of an original painting in oil, although, from the lowness of the price at which they are offered for sale, the services of a skilled painter in oils must necessarily be dispensed with. Presuming that in "poikilography" (the literal meaning of which novel bit of artistic nomenclature is *colour-light-painting*, or painting by light in colours) we have the means of producing a photograph from a painting in *facsimile*, which has been done in an excellent manner, why, we may ask, does not Signor Lombardi carry his invention a little farther, and apply it to the cheap reproduction of portraits other than those from the old masters? May not the principles involved in the production of these "poikilographs" be equally applicable to the reproduction, *à la* oil painting, of the photographs of plain Mr. Jones, Mrs. Robinson, or a group of the Brown family?

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METEOROLOGICAL REPORT.

Observations taken at 406, Strand, by J. H. Steward, Optician.

For the Week ending August 15, 1877.

These Observations are Taken at 8.30 a.m.

Aug.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks
9	29·61	SW	59	63	72	58	Cloudy
10	29·86	W	58	64	71	56	Cloudy
11	29·99	W	56	61	69	55	Cloudy
13	29·92	NE	60	63	72	58	Dull
14	29·80	NE	63	68	81	61	Cloudy
15	29·94	SSE	61	64	—	60	Dull

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 903. Vol. XXIV.—AUGUST 24, 1877.

SOMETHING MORE ABOUT PRECIPITATED PYROXYLINE AND EMULSIONS.

From present evidences it would appear as if the future of emulsion processes lies more in the direction of precipitation than washing in the ordinary manner; and when we consider the saving in time and trouble involved, as well as the more convenient form of the finished product, this is not to be wondered at, provided always that the result is equal in quality to that produced by the older method. During the comparatively short period the method of precipitation has been in use various opinions have been expressed as to its utility, and in many hands it for some time proved, if not a complete failure, at least so uncertain as to place it beyond the bounds of general practice; but repeated trials and a more careful study of the conditions have worked a considerable change of opinion in its favour. We have ourselves made numerous experiments in this direction from time to time, and under the circumstances of the growing importance which attaches to this mode of preparation it may not be out of place if we devote an article to a study of the various conditions which tend to success or otherwise.

In the first place it will be understood that the circumstances surrounding the precipitation of plain collodion are somewhat, if not altogether, different from those attending the manipulation of an emulsion. In the one case our only care is to secure in a convenient form the most valuable portions of the pyroxyline deprived of all matter insoluble in ether and alcohol, though at the same time the solvent action of the water employed in precipitating the cotton works a considerable change in the physical character of the product. In the case of an emulsion we have to deal with, in addition to the pyroxyline, the all-important silver salts and their combination with the constituents of the collodion, and hence it may be supposed that a different course of treatment becomes necessary. It may be remarked that it is a much simpler matter to obtain the precipitate of pure pyroxyline than to secure the emulsion in a state available for re-solution.

It is not necessary to enter into a discussion of the *pros* and *cons* of precipitated pyroxyline; it undoubtedly possesses some advantages over ordinary pyroxyline from a structural point of view, while the convenience of having a pure and perfectly soluble cotton will render it further valuable for many purposes. But in addition to this the operation of precipitation, when developed to its fullest extent, will be found to supply a ready means of so modifying the properties of the pyroxyline treated as to virtually enable us to prepare at will any peculiar description of product to suit special purposes. We do not mean that we are yet in a position to say we have succeeded in thus producing every variety of result, but this we may state—that from a single sample of pyroxyline (and that a very ordinary description) we can, by precipitation, produce widely different properties, and we have not the slightest doubt that further experiment will enable us to systematise the results so obtained, and render them highly valuable.

In its simplest form the precipitation consists in treating a properly-filtered, plain collodion with water in such a manner as to cause the pyroxyline to be thrown down in a state of fine division by abstraction of the solvents. Considerable variations may be made in the character of the resulting precipitate by merely altering the conditions under which this simplest of operations is performed; as, for instance, by varying the strength or viscidity of the collodion, the quantity of water employed in proportion to the collodion, the temperature of the water, or the proportions of ether and alcohol. The precipitation is effected by pouring the collodion slowly into the water, stirring the mixture vigorously during the pouring and for some little time after. The operation may be reversed with a slight variation in the result; but the difference is not so great as when an emulsion is operated upon, the effect being generally the production of a finer precipitate.

If we come to compare the results of a thick or a thin collodion precipitated under similar conditions we shall find that, while the former gives a coarse, spongy product the latter partakes more of a powdery character; and though upon drying the spongy description becomes friable and easily reduced to powder, a difference is noticeable in the films when the two samples are redissolved. The powdery form gives the more limpid collodion, drying to a varnish-like film with but little tenuity, while the other produces a less-easily flowing solution, and the dried film exhibits a tendency to "skinniness." The first mentioned is also the more soluble of the two.

The quantity of water used in precipitation also exercises an important effect on the result; the smaller the proportion of water to collodion the more powdery is the character of the film upon re-solution. Thus, if equal parts of collodion and water be used, the precipitate is obtained in the state of a loose, coherent powder, and when redissolved gives a film powdery almost to rottenness; if the proportion of water be to four or five that of collodion the precipitate is coarser and the resulting film hard and strong.

The difference between the action of cold and hot water is very noticeable; the former, according to other attendant circumstances, forms either a fine powdery precipitate which settles to the bottom of the vessel, or a bulky, flocculent mass which remains chiefly at the surface. Hot water produces a still more bulky, almost "frothy," appearance—at first entirely upon the surface, but as the stirring is continued this breaks up and sinks to the bottom as a fine powder. The two precipitates when dry are readily distinguishable—that resulting from the cold water treatment being invariably, unless purposely reduced to powder, in the state of "flocks" or tufts of greater or less fineness according to circumstances; the other an almost impalpable powder. The latter is extremely soluble, giving a thin, limpid collodion, and a remarkably hard, "short" film.

The proportions of ether and alcohol have a modifying effect at least upon the character of the precipitate; but the difference, if any, in the actual nature of the film upon re-solution is not so noticeable. A preponderance of alcohol leads to a powdery state, the opposite condition producing a tufty or stringy result. The strength of the solvents may also be mentioned as affecting the nature of the product; but it is probable that the result in that case is produced in the collodion itself. All these variations, which are slight in comparison to those we have yet to mention, are dependent upon the character of the original pyroxyline; those we shall next describe amount to an entire change in the properties of material operated upon.

As is well known, the addition of various substances to collodion bring about great changes in its physical properties—sometimes rapidly, sometimes gradually; the quality known as "age" or "ripeness" is the effect of gradual decomposition of the pyroxyline by the mere reaction of the solvents, probably aided by atmospheric influences. It does not seem unreasonable, then, to suppose that by subjecting the cotton to the action of one or other of these substances while in the act of precipitation a corresponding effect would be produced, and such we have found to be in reality the case. The most active agents in producing this change are the acids and alkalies, and we have tested the effect of some of these when added to the water employed in precipitating the collodion. So far our experiments have been scarcely sufficient to do more than enable us to identify the general effect of each substance, and not to fix either the exact proportions to be employed or the conditions under which the application should be made so as to produce the best result. With this object in view we have operated upon portions of the same sample of collodion, using five times the bulk of cold water in each case, and carrying out the manipulations in as nearly as possible the same manner throughout.

Nitric acid produced a fine powdery precipitate of a slightly yellow tinge, the colour being apparently due to partial decomposition and absorption of nitrous acid gas, fumes of which were evolved during the process of precipitation. Upon redissolving the precipitate the collodion was of a pale straw colour, and slightly opalescent; the film tender and rotten. Sulphuric acid gave a harsh, stringy precipitate, free from colour, a clear viscid collodion, and strongly-contractile film. With acetic acid a powdery precipitate was produced, the liquid apparently holding a portion in suspension, and remaining in a state of milkiness. The collodion, after solution, had a milky opalescence, and gave a powdery, rotten film, with a faint trace of the same milky appearance, amounting to semi-opacity at the thick edge. These results show unmistakably the extent to which the nature of the pyroxyline may be modified by the use of various acids.

Turning to the alkalies, we have experimented with ammonia, potash, and soda—all in the caustic state; but, though the modifying action is noticeable, it does not appear likely to be manageable or useful. The pyroxyline is discoloured and rendered partially insoluble, a considerable residue remaining after solution of the precipitate.

It is obvious that the list of substances to be applied in this manner may be extended without limit; but our further experiments have been confined to two. With a view of conferring density we have precipitated the collodion with a ten-grain solution of nitrite of potash in place of plain water, thoroughly washing the precipitate with repeated changes before drying. Upon redissolving the collodion was faintly opalescent, which might arise, however, merely from a trace of unremoved nitrite. Bromised and made into emulsion a slight gain in density was *apparent;* but, in the absence of the exact conditions for comparison, we cannot be certain that the gain was real.

The last experiment was performed with sulphuric acid and gelatine, and, like the previous one, gave evidence of an increase of density; but, until we have compared the result with that obtained from sulphuric acid itself, we cannot say whether it can be credited to the gelatine or the acid alone.

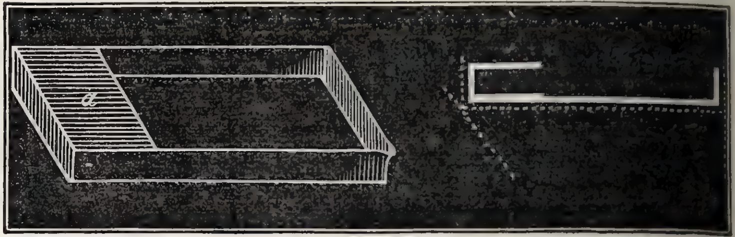
These experiments—which, crude as they are, have occupied some time in performance—will suffice to suggest a line of research for others. In another article we shall proceed to treat on the precipitation of emulsions.

SURFACE MARKINGS ON COLLODION NEGATIVES.

It may be remembered that at the last meeting of the South London Photographic Society the subject of "oyster-shell" or "surface" markings on collodion negatives was introduced for discussion, and that a bath of a certain construction was exhibited by Mr. E. W. Foxlee, who stated that by its adoption no markings of the kind under consideration could possibly occur. When we published the report of the meeting in question we promised to supplement our remarks with a drawing and description of the bath, and that promise we now fulfil.

The bath itself (and we confine our description to one which is now before us) is a flat well-bath formed of porcelain, the well at the end of the tray being of such capacity as to hold enough liquid to flood the plate thoroughly when placed on the bottom of the tray, and an inclined motion given to the latter. This will be better understood from the following diagram (*fig.* 1), in which is represented the bath, the end *a* forming the well of which we have spoken. The open space of the bath represents the dimensions of the largest plate capable of being sensitised, and a ledge upon the bottom, which cannot be shown in the diagram, prevents the plate from slipping down into the well when the tray is tilted upwards in the manner and for the purpose now to be described.

FIG. 1. FIG. 2.



The well-tray is fitted into a wooden case constructed in such a manner as to allow a plate to lie in a horizontal position. It stands on two end-pieces, one of which is inclined inwards at a considerable angle, the object of which is to allow of the bath being reared up on one end in a sloping direction. The diagram (*fig.* 2) shows the configuration of the case in section. The solid line indicates the bath in outline, while the dotted line represents the case.

The use of this apparatus is as follows:—The well having been nearly filled with nitrate of silver solution, and the bath having been previously placed so as to stand at a slope, the collodionised plate is laid upon the bottom, its lower end resting upon the shallow ledge of which we have spoken. An easily-fitting, although light-tight, wooden cover is now placed upon the case, and the bath is laid in a horizontal position, by which the silver solution flows over the plate in an unbroken sweep. All this may be done in a lighted room, owing to the exclusion of the light from the bath. After allowing the plate to remain immersed for any determined portion of time the bath is reared up on end, by which the liquid flows back into the well, leaving the plate in a sloping position to drain.

It has already been shown that the perfect drainage of the plate in a moist atmosphere is an effectual preventive of the formation of surface markings, and it will be seen that the bath now described provides the requisite conditions for effecting the necessary drainage. The interior of the case and of its cover is coated with paraffine, by which both remain unaffected by the moisture.

It will be evident that the bath may be constructed of any other material than porcelain; indeed, if we recollect rightly, the first bath of the kind ever constructed was formed of wood; we allude to the large bath exhibited a few years ago by Mr. H. J. Burton.

The present hot weather, and the consequent prevalence of surface markings, renders this an opportune time for directing special attention to a simple yet excellent piece of apparatus by which the formation of such markings will be rendered impossible.

ON THE SILVER BATH AND ITS CHANGES.

In our article in connection with this subject last week we entered into a calculation showing the maximum amount of silver it would be possible to remove from the bath by the immersion of a number of collodionised plates, and we showed beyond cavil that about five grains per ounce was the extreme limit of the extent to which the bath could be so reduced.

The point is one of such great importance that we particularly call our readers' attention to it, feeling sure that, if they carefully and correctly test their silver solutions by the precipitation method, our theoretical estimate will be practically shown to be more than borne out. Whether this would lead to any great change in practice may depend upon a variety of considerations; for it is obvious that, if an operator who has used with perfect success (say) a sixty-grain bath and called it a thirty-grain would not, upon his error being pointed out and proved to him, at once begin to use a bath which truly was a thirty-grain one.

It would, however, very probably lead to his experimenting to ascertain if a thirty-grain bath would answer. And so it is with regard to the error we have explained. If, under a mistaken impression that his bath is weak, the photographer has periodically strengthened it, till, most likely, instead of being, as he supposes, thirty or thirty-five grains to the ounce it is nearer forty-five or fifty, the chances are that he will continue to make the additions which practice has shown to be desirable, if not absolutely needful. We are naturally not in a position to state the extent to which this strengthening of the bath prevails amongst the great body of photographers; but it is sufficient to refer to our own columns, in past months, to see how frequently it is recommended both at home and abroad. It is no uncommon thing to read that "after a day's hard work the bath is tested and made up to strength."

We have already shown how utterly unreliable any but the precipitating method is for baths charged with alcohol and ether. The best method is to use a graduated argentometer or precipitating tube, on which, when, the test quantity is entirely precipitated, the number of grains per ounce is read off direct. The expense of the graduated tube need not be considered, as a sufficiently-close reading is given, if a common one-ounce glass measure, graduated to drachms, be used to measure the precipitating solution, the mixing being performed in a narrow bottle of suitable size. The calculation necessary is too slight to allude to.

A third method still may be adopted by graduating one's own tube, which can easily be done with a little care, as follows:—An evenly-drawn tube, about three-eighths or half-an-inch bore and twelve or fourteen inches long, is closed by means of a cork, preferably smeared with paraffine (we are assuming that sufficient skill to close a tube and round its end are not available) and securely fastened into its place so as not to be easily removed. Then, taking a measured quantity of water, equal to the test quantity of bath usually taken, which is generally a drachm, it is poured into the tube, and the height it stands carefully marked with a diamond or three-corner file; next, as much water is added as there would be precipitation fluid used to throw down a hundred grains of silver, and its level is also carefully marked as just directed. Then, taking a piece of paper of the exact length of the distance between the two marks, and doubling it up repeatedly, we get a guide which we can bring to any degree of accuracy, and from which the gradations may be easily scratched upon the tube by the file; or even the paper itself may be carefully cut and trimmed as narrow as possible consistent with showing the graduating marks, and then pasted upon the tube and varnished with a little paper varnish to protect it.

With regard to those photographers whose use of their materials is limited to occasional experimenting: we think they may safely ignore any chance of their baths becoming weakened by use; indeed they are far more likely to become stronger, and would, certainly if the fluid were left in their bath-holder between times, as aqueous solutions exposed very slightly to the air, lose bulk by evaporation to a greater extent than many are aware of. Naturally this same evaporation goes on also with the well-worked professional photographic bath. In the summer weather, just at the time the operator is most likely to be using it well, the evaporation would amount, in a dark room of average temperature, to not far from a third of an inch in a week's time, and this, with our typical half-gallon bath, which would about fill to working height a glass bath-holder fourteen inches deep, would amount to a reduction in bulk of over two ounces, or close upon three per cent. This would be equivalent to strengthening the bath with seventy or eighty grains of silver, thus still further reducing the lowering of strength to about four grains instead of the five which we obtained when disregarding this item. We, however, lay less stress upon this point, as all the data are so liable to variation, and the result cannot be predicated with the mathematical exactness permissible with our former calculations.

We have on former occasions alluded to the system of using two baths for plates in progress, and whenever much work is to be done no other plan should be adopted, the difference in the cleanliness of the plates, the care in working, the uniformity in quality of the film, and the generally better tone of the resulting negative, are all so vastly in favour of the plan that, once adopted, as we are pleased to think is much more frequently done of late, no one would think of giving it up. We allude to it in this connection to point out the difference between the conditions of the two baths.

The first bath, as it is usually called, into which the plates were first dipped is that to which the remarks in our previous article are intended to apply; for the second bath, that is, the one into which the already-sensitised plate is redipped, holds quite a different relation.

In the first place the plate is immersed in it in a dripping condition, the back wetted, and the film full of liquid, with a surplus on its surface; hence this bath in use never diminishes in bulk, but rather increases. In the second place, as all the ether and alcohol are dissolved out of the film into the first bath, the only portion of these liquids found in the second bath are merely in such proportion as would result from the addition of a small quantity of the first bath to it. And, finally, there being practically no unchanged iodides or bromides in the film, the second bath preserves its strength unaltered from that cause, and, no matter how many plates are put in, except in so far as the constant addition of the small quantities of the first bath bring down its strength to some slight extent, its strength remains unimpaired.

In practice, therefore, if, when the first bath is reduced in bulk it is made up again by the addition of some of the second bath, and that again by new bath, a regular round is instituted, which need rarely be interfered with if the baryta be added at occasional but not frequent intervals in the small proportion we have on a former occasion recommended.

In his *Notes from the North*, in our last number, Dr. John Nicol describes, on the evidence of a correspondent, what is to be the panacea for all the ills connected with alkaline development, namely, the substitution of carbonate of soda for ammonia, as now commonly employed. Though ammonia has heretofore held the premier position in general estimation for the purpose named, there are one or two serious drawbacks to its use, its volatile nature and its solvent action upon the film as well as the developed image being the chief. Carbonate of soda is free from both these objections, so are other alkaline salts; hence it may be asked why ammonia has not been long ago supplanted by soda for potash or their carbonates. If we were called upon to reply to such a question, we should at once refer our querist to the series of experiments published by Major Russell, we think upwards of a dozen years ago, in which various salts of ammonia, soda, and potash, with others, were pitted one against the other, and the result of which was overwhelmingly in favour of the ammonia, both as regards efficiency and controlability. Next to ammonia in order of merit came soda, and last potash; but the two latter, though exercising a powerful developing action, were too far beyond management to be practically useful. Since that date the late Mr. Sutton made an attempt to bring carbonate of soda into favour, alleging as its principal recommendation its non-solving action upon the film, but we are not aware that he succeeded in inducing many to adopt his suggestion, nor do we believe that he continued its use himself. At the present time, with an increased knowledge of the practice and requirements of alkaline development, we have no reason to expect any reversal of the results of Major Russell's experience; and should any of our readers have cause to complain of the results produced by ammonia development we should advise them to seek for the cause of their non-success in other directions before turning to the old carbonate of soda modification.

DISCOVERY OF OXYGEN IN THE SUN BY PHOTOGRAPHY, AND A NEW THEORY OF THE SOLAR SPECTRUM.

[A communication to the American Philosophical Society.]

I PROPOSE in this preliminary paper to indicate the means by which I have discovered oxygen, and probably nitrogen, in the sun, and also to present a new view of the constitution of the solar spectrum.

Oxygen discloses itself by bright lines or bands in the solar spectrum, and does not give dark absorption lines like the metals. We must, therefore, change our theory of the solar spectrum, and no longer regard it merely as a continuous spectrum with certain rays absorbed by a layer of ignited metallic vapours, but as having also bright lines and bands superposed on the background of continuous spectrum. Such a conception not only opens the way to the discovery of others of the non-metals, sulphur, phosphorus, selenium, chlorine, bromine, iodine, fluorine, carbon, &c., but also may account for some of the so-called dark lines, by regarding them as intervals between bright lines.

It must be distinctly understood that in speaking of the solar spectrum here I do not mean the spectrum of any limited area upon the disc or margin of the sun, but the spectrum of light upon the whole disc. I have not used an image of the sun upon the slit of the spectroscope, but have employed the beam reflected from the flat mirror of the heliostat without any condenser.

In support of the above assertions the accompaning photograph of the solar spectrum with a comparison spectrum of air, and also with some of the lines of iron and aluminium, is introduced. The photograph itself is absolutely free from handwork or retouching. It is difficult to bring out in a single photograph the best points of these various substances, and I have, therefore, selected from the collection of original negatives that one which shows the oxygen coincidences most plainly. There are so many variables among the conditions which conspire for the production of a spectrum that many photographs must be taken to exhaust the best combinations. The pressure of the gas, the strength of the original current, the number of Leyden jars, the separation and nature of the terminals, the number of sparks per minute, and the duration of the interruption in each spark, are examples of these variables.

In the photograph the upper spectrum is that of the sun, and above it are the wave-lengths of some of the lines to serve as reference numbers. The wave-lengths used in this paper have been taken partly from Angström and partly from my photograph of the diffraction spectrum published in 1872. The lower spectrum is that of the open-air Leyden spark, the terminals being one of iron and the other of aluminium. I have photographed oxygen, nitrogen, hydrogen, and carbonic acid, as well as other gases, in Plücker's tubes, and also in an apparatus in which the pressure could be varied, but for the present illustration the open-air spark was, all things considered, best. By other arrangements the nitrogen lines can readily be made as sharp as the oxygen are here, and the iron lines may be increased in number and distinctness. For the metals the electric arc gives the best photographic results, as Lockyer has so well shown, but as my object was only to prove by the iron lines that the spectra had not shifted laterally past one another, those that are here shown at 4325, 4307, 4271, 4063, and 4045 suffice. In the original collodion negative many more can be seen. Below the lower spectrum are the symbols for oxygen, nitrogen, iron, and aluminium.

No close observation is needed to demonstrate to even the most casual observer that the oxygen lines are found in the sun as bright lines, while the iron lines have dark representatives. The bright iron line at G (4307), on account of the intentional overlapping of the two spectra, can be seen passing up into the dark absorption line in the sun. At the same time the quadruple oxygen line between 4345 and 4350 coincides exactly with the bright group in the solar spectrum above. This oxygen group alone is almost sufficient to prove the presence of oxygen in the sun; for, not only does each of the four components have a representative in the solar spectrum, but the relative strength and the general aspect of the lines in each case are similar. I do not think that in comparisons of the spectra of the elements and sun enough stress has been laid on the general appearance of lines apart from their mere position; in photographic representations this point is very prominent. The fine double line at 4319, 4317, is plainly represented in the sun. Again: there is a remarkable coincidence in the double line at 4190, 4184. The line at 4133 is very distinctly marked. The strongest oxygen line is the triple one at 4076, 4072, 4069, and here again a fine coincidence is seen, though the air spectrum seems proportionately stronger than the solar. But it must be remembered that the solar spectrum has suffered from the transmission through our atmosphere, and this effect is plainest in the absorption at the ultra-violet and violet regions of the spectrum. From some experiments I made in the summer of 1873 it appeared that this local absorption is so great, when a maximum thickness of air intervenes, that the exposure necessary to obtain the ultra-violet spectrum at sunset was two hundred times as long as at midday. I was at that time seeking for atmospheric lines above H like those at the red end of the spectrum, but it turned out that the absorptive action at the more refrangible end is a progressive enfeebling one, as if a wedge of neutral-tinted glass were being drawn lengthwise along the spectrum towards the less refrangible end.

I shall not attempt at this time to give a complete list of the oxygen lines with their wave lengths accurately determined, and it will be noticed that some lines in the air spectrum which have bright analogues in the sun are not marked with the symbol of oxygen. This is because there has not yet been an opportunity to make the necessary detailed comparisons. In order to be certain that a line belongs to oxygen, I have compared, under various pressures, the spectra of air, oxygen, nitrogen, carbonic acid, carburetted hydrogen, hydrogen, and cyanogen. Where these gases were in Plücker's tubes a double series of photographs has been needed, one set taken with, and the other without, Leyden jars.

As to the spectrum of nitrogen and the existence of this element in the sun, there is not yet certainty. Nevertheless, even by comparing the diffused nitrogen lines of this particular photograph, in which nitrogen has been sacrificed to get the best effect for oxygen, the character of the evidence appears. The triple band between 4240, 4227, if traced upward into the sun, has approximate representatives. Again, at 4041 the same thing is seen, the solar bright line being especially marked. In another photograph the heavy line at 3995, which in this picture is opposite an insufficiently-exposed part of the solar spectrum, shows a comparison band in the sun.

The reason I did not use air in an exhausted Plücker's tube for the production of a photograph to illustrate this paper, and thus get both oxygen and nitrogen lines well defined at the same time, was partly because a brighter light can be obtained with the open-air spark on account of the stronger current that can be used. This permits the slit to be more closed, and, of course, gives a sharper picture. Besides, the open-air spark enabled me to employ an iron terminal, and thus avoid any error arising from accidental displacement of the reference spectrum. In Plücker's tubes with a Leyden spark the nitrogen lines are as plain as those of oxygen here. As far as I have seen, oxygen does not exhibit the change in the character of its lines that is so remarkable in hydrogen under the influence of pressure, as shown by Frankland and Lockyer.

The bright lines of oxygen in the spectrum of the solar disc have not been hitherto perceived, probably from the fact that in eye observation bright lines on a less bright background do not make the impression on the mind that dark lines do. When attention is called to their presence they are readily enough seen even without the aid of a reference spectrum. The photograph, however, brings them into greater prominence. From purely theoretical considerations, derived from terrestrial chemistry and the nebular hypothesis, the presence of oxygen in the sun might have been strongly suspected, for this element is currently stated to form eight-ninths of the water of the globe, one-third of the crust of the earth, and one-fifth of the air, and should therefore probably be a large constituent of every member of the solar system. On the other hand, the discovery of oxygen, and probably other non-metals in the sun, gives increased strength to the nebular hypothesis, because to many persons the absence of this important group has presented a considerable difficulty.

At first sight it seems rather difficult to believe that an ignited gas in the solar envelope should not be indicated by dark lines in the solar spectrum, and should appear not to act under the law that "a gas when ignited absorbs rays of the same refrangibility as those it emits." But, in fact, the substances hitherto investigated in the sun are really metallic vapours, hydrogen probably coming under that rule. The non-metals obviously may behave differently. It is easy to speculate on the causes of such behaviour, and it may be suggested that the reason of the non-appearance of a dark line may be that the intensity of the light from a great thickness of ignited oxygen overpowers the effect of the photosphere, just as if a person were to look at a candle flame through a yard thickness of ignited sodium vapour he would only see bright sodium lines, and no dark absorption lines. Of course such an explanation would necessitate the hypothesis that ignited gases such as oxygen give forth a relatively large proportion of the solar light. In the outburst of *T. coronæ*, Huggins showed that hydrogen could give bright lines on a background of spectrum analogous to that of the sun.

However all that may be, I have no doubt of the existence of substances other than oxygen in the sun which are only indicated by bright lines. Attention may be called to the bright bands near G, from wave lengths 4307 to 4337, which are only partly accounted for by oxygen. Farther investigation in the direction I have thus far pursued will lead to the discovery of other elements in the sun, but it is not proper to conceal the principle on which such researches are to be conducted for the sake of personal advantage. It is also probable that this research may furnish the key to the enigma of the D_3 or helium line, and the 1474 K or corona line. The case of the D_3 line strengthens the argument in favour of the apparent exemption of certain substances from the common law of the relation of emission and absorption; for, while there can be no doubt of the existence of an ignited gas in the chromosphere giving this line, there is no corresponding dark line in the spectrum of the solar disc.

In thus extending the number of elements found in the sun, we also increase the field of inquiry as to the phenomena of dissociation and recomposition. Oxygen, especially from its relation to the metals, may readily form compounds in the upper regions of the solar atmosphere which can give banded or channeled spectra. This subject requires careful investigation. This diffused and reflected light of the outer corona could be caused by such bodies cooled below the self-luminous point.

This research has proved to be more tedious and difficult than would be supposed, because so many conditions must conspire to produce a good photograph. There must be a uniform prime moving engine of two-horse power, a dynamo-electric machine thoroughly adjusted, a large Ruhmkorff coil with its Foucault break in the best order, a battery of Leyden jars carefully proportioned to the Plücker's tube in use, a heliostat, which of course involves clear sunshine, an optical train of slit, prisms, lenses and camera, well focussed, and, in addition to all this, a photographic laboratory in such complete condition that wet sensitive plates can be prepared which will bear an exposure of fifteen minutes and a prolonged development. It has been difficult to keep the Plücker's tubes in order; often before the first exposure of a tube was over the tube was ruined by the strong Leyden sparks. Moreover, to procure tubes of known contents is troublesome. For example: my hydrogen tubes gave a spectrum photograph of fifteen lines, of which only three belonged to hydrogen. In order to be sure that none of these were new hydrogen lines it was necessary to try tubes of various makers, to prepare pure hydrogen and employ that, to examine the spectrum of water, and finally to resort to comparison with the sun.

The object in view in 1873, at the commencement of this research, was to secure the means of interpreting the photographs of the spectra of stars and other heavenly bodies obtained with my twenty-eight-inch reflector. It soon appeared that the spectra of nitrogen and other gases in Plücker's tubes could be photographed, and at first some pictures of hydrogen, carbonic acid, and nitrogen were made, because these gases seemed to be of greatest astronomical importance on account of their relation to stars, nebulæ, and comets. Before the subject of comparison spectra of the sun was carefully examined there was some confusion in the results, but by using hydrogen the source of these errors was found out.

But in attempting to make a prolonged research in this direction it soon appeared that it was essential to be able to control the electrical current with precision, both as to quantity and intensity, and, moreover, to have currents which, when once adjusted, would remain constant for hours together. These conditions are almost impossible to attain with any form of battery, but, on the contrary, are readily satisfied by dynamo-electric machines. Accordingly, I sought for a suitable dynamo-electric machine and motor to drive it, and after many delays procured a combination which is entirely satisfactory. I must here acknowledge my obligations for the successful issue of this search to Professor George F. Barker, who was the first person in America to procure a Gramme machine. He was also the first to use a Brayton engine to drive a Gramme.

The dynamo-electric machine selected is one of Gramme's patent, made in Paris, and is a double light machine—that is, it has two sets of brushes, and is wound with wire of such a size as to give a current of sufficient intensity for my purpose. It is nominally a 350-candle light machine, but the current varies in proportion to the rate of rotation, and I have also modified it by changing the interior connections. The machine can produce as a maximum a light equal to 500 standard candles, or by slowing the rotation of the bobbin the current may be made as feeble as that of the weakest battery. In practical use it is sometimes doing the work of more than fifty large Grove nitric acid cells, and sometimes the work of a single Smee.

The Gramme machine could not be used to work an induction coil when it first reached me, because when the whole current was sent through the Foucault interruptor of the Ruhmkorff coil, making 1000 breaks per minute, the electro-magnets of the Gramme did not become sufficiently magnetised to give an appreciable current. But by dividing the current so that one pair of the metallic brushes, which collect from the revolving bobbin, supplied the electro-magnets, the other pair could be used for exterior work, no matter whether interrupted or constant. The current obtained in this way from one pair of brushes when the Gramme bobbin is making 1200 revolutions per minute is equal to 100 candles, and is greater in quantity than one would like to send through a valuable induction coil. I usually run the bobbin at 622 revolutions per minute, and this rate will readily give 1000 ten-inch sparks per minute with the eighteen-inch coil. Of course a Plücker's tube lights up very vividly, and generally, in order to get the maximum effect, I arrange the current so that the aluminium terminals are on the point of melting. The glass, particularly in the capillary part, often gets so hot as to char paper.

As long as the Gramme bobbin is driven at a steady rate the current seems to be perfectly constant; but variations of speed make marked differences in the current, and this is especially to be avoided when one is so near the limit of endurance of Plücker's tubes. A reliable and constant motor is, therefore, of prime importance for these purposes. A difference of one per cent. in the speed of the engine sometimes cannot be tolerated, and yet at another time one must have the power of increasing and diminishing the rate through wide limits. The only motor among many I have examined and tried that is perfectly satisfactory is Brayton's petroleum ready motor. This remarkable and admirable engine acts like an instrument of precision. It can be started with a match, and comes to its regular speed in less than a minute; it preserves its rate entirely unchanged for hours together. Moreover, it is economical, cleanly, and not more noisy than a steam engine. The one of two-horse power I have ran for six months, day and night, supplying water and air to the aquaria in the Centennial Exhibition at Philadelphia. At any tine on going into the laboratory it can be started in a few seconds, even though it has not been running for days. HENRY DRAPER, M.D.
—*Journal of the Franklin Institute.*

ALKALINE DEVELOPMENT WITHOUT PYROGALLIC ACID FOR DRY PLATES.

MY plates are 18 × 16. I have a tin dish one and a-half inch deep —sufficiently large for the plates. The inside of the dish has had several coats of white paint, and answers admirably both for developing and washing plates.

Preparatory to developing I pour into the dish as much tap water as will fill it about half-an-inch deep. I then drop into the water about twenty drops of strong liquor ammonia, rock the water about to mix it with the ammonia, then take the plate from the dark slide and place it in the dish, collodion side up, taking care to flow the water over at one wave to prevent developing lines. The image will appear immediately.

It is as well to rock the dish to cause the water to wash off the preservative; at the same time the same water will develope two or more plates, if used at once.

Wash and intensify with acid silver and pyro. If fully exposed very little intensification will be required. I can easily finish one plate while the other is left in the water. REUBEN MITCHELL.

A NEW METHOD OF PRECIPITATING EMULSIONS.

IN accordance with the promise made in my last article I now propose to give the formulæ which I have found to answer best with the new mode of manipulation. Naturally the first point of importance is the pyroxyline. I have, as yet, only tried two samples—one, my ordinary emulsion sample, giving a tolerably porous film; and another prepared by precipitation, *à la* Chardon. The first gives very good results; but I rather think that the second requires less careful treatment. Probably a specially-prepared sample of a more "horny" description than is usually employed in emulsion work would be found better still, though I am not yet able to say so definitely, If the precipitation of an ordinary emulsion be sometimes attended with uncertainty, such will be doubly the case in the new method unless due attention be paid to the special requirements for ensuring success. The difficulty will be, however, not in obtaining a clean precipitate—for in the presence of free silver this is easily secured—but in precipitating the pyroxyline and silver bromide *in combination.* Without proper care there is a great tendency to separate the two; and though the precipitate is, to all appearance, what it ought to be, it is found upon re-emulsification that a large proportion of the silver bromide has been formed in a very coarse state, and has to be removed by filtration, leaving a thin, poor emulsion. The employment of a more "skinny" pyroxyline seems to lessen this danger of separation, and with the exercise of care in other details it is entirely removed.

I prepare a thick collodion as follows:—

Pyroxyline	25 to 30 grains.
Double bromide of cadmium and ammonium	50 ,,
Ether	1¾ ounce.
Alcohol	1¼ ,,

The convenience of using *precipitated* pyroxyline will be very evident here, as, in addition to its easy solubility, it requires no filtering, but is clear and ready for use as soon as dissolved; whereas, if ordinary pyroxyline be used, the collodion is so thick that it requires a very long time for the undissolved particles to subside. The extra cost of the precipitated cotton forms a great objection to its use; but I fancy those who try it will find its advantages to be equal to its extra price. I use the double bromide of cadmium and ammonium, because it combines, I think, in the greatest degree all desirable good qualities with uniformity. Cadmium bromide alone is a very uncertain salt, even when dried or fused; but the combination, if carefully preserved, appears to be quite stable. Bromide of zinc, though excellent in action, is too uncertain in composition. One sample I have tried contained more than thirty per cent. of insoluble oxide, and when purified could not be weighed out with any accuracy.

For the convenience of those who have not the facilities for preparing the double salt, I will give what forms, as nearly as possible, the equivalent of bromide in the formula:—Weigh out thirty-six grains of ordinary crystallised bromide of cadmium as obtained from the chemist (if the *dried* salt be used thirty-two and a-half grains only will be required), and twenty-one grains of dried bromide of ammonium. Triturate the two salts in a small mortar without the addition of either water or alcohol, and in a minute or two they will enter into combination, forming a thick paste; rub this perfectly smooth, and then add gradually the necessary quantity of alcohol. The two salts if treated in this way dissolve with the greatest ease, which is not the case so far as regards the ammonium if dissolved separately.

The next point is the preparation of the silver solution; this should be strong enough to leave an excess after converting the soluble bromide, but not so strong as to leave too large a quantity to be recovered from the waste solution. Each ounce of the above collodion will require a fraction over twenty-four grains of silver to convert the whole of its bromide, and we have to consider how much more may be used with advantage. In order to reproduce as nearly as possible the conditions of a plate sensitised in a strong bath we ought to employ a solution of a hundred and fifty or a hundred and sixty grains of silver to the ounce; but this is obviously out of the question, as in using equal bulks of collodion and silver solution we should have to extract from the waste solution *five times* as much silver as had been taken up by the collodion. I have tried the possibility of using the same solution over again for precipitating a fresh quantity of collodion, but the accumulation of ether and alcohol was too great; and if the mixture be boiled to drive off the volatile portions it becomes so discoloured from the action of the free silver as to render the probability of subsequent success somewhat remote.

It does not appear from the experiments I have made with varying proportions of silver in excess that the gain in sensitiveness is commensurate with the increase of silver, while in proportion as the latter is increased so does the risk of fogging the emulsion become greater. Thus, with the above collodion, I have used an excess of silver varying from five or six to thirty grains to the ounce; or, in actual quantity, I have used an equal bulk of silver solution varying in strength from thirty to sixty grains, with the only result that the stronger solution necessitated the soaking of the pellicle in a soluble bromide or chloride previous to drying. At present, therefore, I am inclined to think that an excess of from six to ten grains to the ounce of collodion will be found ample; but, as a strong silver solution shows less tendency to separation of the bromide and pyroxyline, I reduce the quantity of water in which the nitrate is dissolved.

In order to sensitise the above quantity of collodion, viz., three ounces, I take—

Nitrate of silver	90 grains.
Nitric acid	3 minims.
Water	1½ ounce.

The method of precipitation is of great importance; indeed, the whole success of the emulsion depends upon that one point. If the silver solution be poured into the collodion a very nice, clean, and easily-collected precipitate is formed; but it will not re-emulsify, owing to the almost total separation of the bromide. The collodion must be poured into the silver, and even here great care is requisite. In M. Chardon's process the emulsion is poured into water with very violent stirring, but if the same method be followed in this case the result is not satisfactory. What appears to be necessary to prevent the separation of the bromide is that the collodion be poured in gently, a little at a time, in such a manner that the clots formed are not too rapidly broken up. This is best done by placing the silver in a wide-mouthed bottle or other suitable vessel, and pouring the collodion into it, a few drops at a time, the bottle being gently agitated after each addition so as to separate the clots and bring them into full contact with the solution. In this manner each drop as it touches the solution becomes coagulated, as it were, upon the surface only, the outer skin thus formed allowing the solution to permeate gradually into the interior; after a lapse of three or four minutes the whole may be vigorously shaken to break up the clots as fine as possible, and left until fully sensitised.

The latter process will be complete in from twenty to thirty minutes. If the emulsion do not show signs of perfect precipitation a little more water should be added until it settles down as a coarse, flocculent powder, leaving the supernatant liquor quite clear. This is then poured off and replaced by clean water, which, after a vigorous shake, is allowed to subside. Three or four changes will prove quite sufficient to remove all soluble matter; but it is as well to test for free silver before drying.

At this stage it may be useful to apply an organifier. I do not find such a course absolutely necessary; but many I know prefer to adopt one or other of the favourite preservatives. I cannot recommend the practice of applying the organifier in the presence of free silver, even when restraining acid is used; the precipitate is generally more or less discoloured upon drying, and the resulting emulsion necessarily partakes of the same character. I have had on more than one occasion direct evidence of unstability, arising apparently from that source alone.

No harm can accrue, however, if the free silver be entirely removed before applying the organifier, which in turn must be washed off the precipitate before drying. In this manner the effects of such substances as tannin, gallic, and salicylic acids, or coffee are secured without introducing any foreign matter into the finished emulsion. I have secured very good results with coffee and gum, and also with coffee and gallic acid; but perhaps this is a matter of taste depending upon individual fancies. The precipitate should not discolour under the action of the organifier nor in drying; should such occur it is a sign that the free silver has been imperfectly removed.

After removing all traces of the organifier the powdered emulsion is collected on a linen filter, and, after pressing out the superfluous moisture, is transferred to a porcelain dish and dried at a gentle heat. It should then have the form of a fine powder, which dissolves almost instantly in equal parts of ether and alcohol, forming, if all has been right, a fine, smooth emulsion quite free from granularity.

A modification of this method, which possesses some advantages, consists in sensitising an emulsion in the ordinary way, and allowing it to ripen in the presence of an excess of soluble bromide; it is then precipitated by pouring it into a solution of silver of sufficient strength.

In concluding these notes I must reiterate the importance attaching to the manner in which the precipitation is performed; if carried out as I have directed no difficulty will be experienced provided the pyroxyline be suitable, and the process will, I think, be found a great convenience in more ways than one. W. B. Bolton.

N.B.—I noticed Dr. Liesegang's formula in your last number, and would call attention to the fact that the precipitation is performed in the presence of excess of soluble bromide.—W. B. B.

PHOTOGRAPHIC RESEARCHES IN THE DRY PROCESSES, AND SIMULTANEOUS EXPOSURE AND DEVELOPMENT.

The other day I occupied myself in enthusiastic efforts with the emulsion process in order to try and succeed in obtaining the followng conditions and qualifications, viz., sensitiveness, facility of pre-aration, and certainty in the results.

It may seem strange to say that we have simply to coat a plate vith collodion, place it in the dark slide, and expose it, and that fter a certain time it will be developed. With the new process of mulsion there is certainly one thing not only true but very easy in ts execution—the sensitised plate spontaneously developes itself fter exposure. We have advanced photography to such a stage as o be in a position to discard the sensitising bath, washing, and leveloping. By utilising the experiments given by several of our ractical experimentalists I have obtained some proofs with spon-aneous development which would lead me to believe that this rocess is practicable.

Take one ounce of emulsion of the following preparation:—

Ether	15½	drachms.
Alcohol	12	„
Powdered pyroxyline	22	grains.
Bromide of zinc or ammonium	22	„
„ uranium	22	„
Chloride of barium	2	„

I sensitise with one drachm of nitrate of silver. To the emulsion I add five to ten drops of a ten-per-cent alcoholic solution of gallic or pyrogallic acid, three or four drops of acetic acid saturated with acetate of lead, and about seventeen drops of pure glycerine. This solution should not be prepared long before being used, as it does not keep well. These substances are carefully mixed with the emulsion. It is preferable, before using, to give the plate a substratum of india-rubber. The exposure required will be about double that needed for ordinary wet plates.

The exposure being completed, we take the dark slide out of the camera and set it on one side; but it is better to place the plate in a box containing some damp leaves of paper, supporting it on corks in order to prevent its coming in contact with the leaves.

In from one to two hours we again look at the plate. We will be agreeably surprised to find that the image is perfectly developed, ready to undergo the operation of fixing. If, however, the image be rather weak, the ordinary mode of intensifying may be resorted to. The proofs thus obtained are very vigorous, and have no tendency to fog.

Ernest Boivin.

—*Le Moniteur de la Photographie.*

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PRACTICAL DETAILS OF CARBON PRINTING BY "SINGLE TRANSFER."*

A sufficient supply of sensitive tissue having been provided by the means indicated in my last communication, the next step to be considered is the exposure in the printing-frame. Few observations are necessary as to this phase of the operations, except that the formation of a "safe edge"† to the negative must not be omitted, or a breaking up of the film during development—especially where a deep shadow terminates in the edge of the negative—will be the result.

With regard to the light: it has often been recommended to print only in the shade; but in many cases, unless in very hot sun, I am inclined to think that sun-printing is not at all disadvantageous. We must never forget that bichromated paper is much more sensitive than silver; but it must also not be forgotten that the bichromate is less sensitive to *feeble* rays of light, in *proportion*, than is silver, so that, especially when weak solutions of bichromate have been used for sensitising, we often obtain with a short exposure to bright light more brilliant and harmonious prints than by longer exposure to one less intense.

The fundamental difference existing between silver and bichromate printing—namely, that in the latter case the progress of the change which is being produced by the action of the light cannot, for obvious reasons, be watched with the eye—renders the use of an independent standard, as a register of the light's action, necessary. We are obliged, therefore, to have recourse to the actinometer or photometer. There are several forms of this instrument, each of which has its advocates. Perhaps the most simple consists of a series of thicknesses of paper (or other translucent material) arranged in a small frame, with a number denoting the respective opacity of the portion to which it refers. The screen so formed is employed as a sort of test negative, either with silvered or bichromated paper, the extent to which the printing proceeds being indicated by the appearance of each number in succession on the prepared paper, the amount of printing required being judged of by a previous trial.

There is still another very marked difference between the printing of a silver and a carbon print, inasmuch as the change set up by the action of light ceases in the former case upon the cessation of its direct action, while in the latter the change of condition continues slowly, even after the withdrawal of the exposed tissue from the light. If the development of the picture is intended to be carried out at once, the printing is permitted to go on till the exposure is complete; but if, on the other hand, some hours are intended to elapse, allowance should be made for this continuing action.

The exposure being completed the preparation of the surface upon which the development will be effected demands our attention. This is usually paper coated with a thin layer of gelatine, to which enough chrome alum has been added to prevent the re-solution of the gelatine after it has once become dry. Although paper prepared for the purpose may be purchased ready for use, it may sometimes be convenient to be able to prepare it oneself; and this will be especially desirable if it be wished to employ paper that cannot be readily procured commercially—such as drawing-paper of some particular tint, a panel of wood, or some such article upon which we are anxious to produce our picture. For this purpose a solution of gelatine of about four per cent. may be used—such, for, instance as will be obtained by dissolving four ounces of gelatine (Nelson's flake gelatine being a very suitable quality) in six pounds, by weight, of water. The gelatine may be allowed to soak in the water (cold) for half-an-hour or so, and the temperature then raised to about 130° to 140° Fahr., when solution will have been effected. A hundred and twenty grains of chrome alum should then be dissolved in four ounces of tepid water (*not boiling*, for this induces a peculiar decomposition of the salt), and gradually added, stirring briskly all the while, and the solution then strained through a fold or two of fine muslin. The solution should be maintained at about the above temperature; for, if it be allowed to become cold and gelatinise, it is difficult to re-melt the jelly so formed. The sooner it is used the better, and any portion not used may be thrown away, as it speedily deteriorates by keeping. Sheets of paper may be floated upon the solution, or it may be applied to any surface by means of a broad camel's-hair brush, in the case of thick drawing-paper, two coatings being desirable, the first being allowed to dry completely before the application of the second.

The coating of gelatine thus obtained upon the surface to which it has been applied, when once thoroughly dry (although it will upon immersion in water swell and become slimy), will not dissolve even in water at as high a temperature as 160° or 180°, which is higher than any carbon print need ever be exposed to.

As the transfer paper thus prepared improves by keeping a considerable quantity may be prepared beforehand and retained for use.

To attach the surface of the exposed picture to that of the transfer paper for the purpose of development, a piece of the latter, about half an inch larger than the other, is taken and immersed in cold water, which should not be allowed to exceed 58° or 60° Fahr. The tissue is immersed in the same water, and both withdrawn after a few seconds, face to face with each other, then laid upon a plate of glass or metal, or even a smooth board, tissue upwards, and the squeegee applied to scrape away the excess of fluid. The papers thus united are placed between folds of blotting-paper or bibulous board for a few minutes to adhere.

When the sheets are very large it is desirable to remove the transfer paper from the water first, laying it, with the prepared side upwards, on a plate of metal or slate, and then, having passed the hand over the face of the tissue while in the water to be certain of removing any impurities from the surface, lay that, face downwards, on the transfer paper, and apply the squeegee.

In describing this portion of the operation in the editorial article (August 10, page 373) it was mentioned that the papers thus brought into contact should be allowed to dry either wholly or partially. As these directions, if followed literally, might cause some difficulty in the development, I think it well to say that to allow them to dry *completely* is a positive mistake, the development never under such circumstances taking place with regularity. If they remain in contact from one to five minutes it is sufficient. If, upon examination of the transfer paper to which the tissue has been attached *the yellow colour of the bichromate is perceived to have permeated to the back of it, it is certain that the picture is ready for development.*

The picture is then plunged into warm water of the temperature of about 90° to 100° Fahr., a matter of a few degrees being immaterial. If, upon immersion in the warm water, minute bubbles of air appear upon the back of the tissue it is desirable to raise the whole out of the water for a moment and then immediately to return it, repeating this, if necessary, a second and third time, should a further crop of bubbles appear, which is seldom the case, unless the water be unnecessarily hot. After the lapse of a few seconds some of the colouring matter and soluble gelatine will be seen to exude from the edge of the tissue, when the tissue may be pulled away from the transfer paper, leaving the greater portion of the gelatine and pigment attached thereto, showing nothing but a black, slimy-looking coating to the whole sheet. Upon laving the water over the surface with the hand this gradually disappears, the high lights of the picture first presenting themselves in a somewhat indistinct manner, but which by degrees become more perfect, while the half-tones and shadows gradually unfold.

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* Concluded from page 390.

† This "safe edge" may be made by painting the edge of the negative to the extent of an eighth of an inch all round with black varnish, or by attaching slips of semi-opaque paper to the edge of the negative. The use of a mask of any form will answer all the purpose, the object being to retain the extreme edge of the tissue in a soluble condition.

If the exposure have been correctly timed the picture, in the course of a few minutes, stands revealed in perfect gradation. If the exposure have been insufficient the high lights will be raw, the half-tones feeble, and the shadows deficient in force; while, if the exposure have been too great, the picture will be heavy and loaded in the shadows, lacking brilliancy and transparency in the high lights and half-tones, the solution of the gelatine taking place with some difficulty.

Should it be noticed at the commencement of the development that the picture comes out very rapidly, it is well to moderate the temperature of the water; but if, on the contrary, the picture appear but slowly and then too dark, hotter water may be used to complete the development. By this means we have some control over the exposure, and an under- or over-exposed print may, by judicious treatment, be made to yield a serviceable picture, though of course for absolute perfection a correct judgment of the exposure is necessary.

When the whole of the details of the subject are fully developed, and the solvent action of the water seems complete, the picture may be placed in clean cold water for a few minutes, and then removed to another dish containing a solution of alum. The strength of this solution is not very material, though it is perhaps better not to be too strong, about one or two per cent. being quite sufficient. The object of this treatment is especially to remove the last trace of bichromate of potash from the fibre of the paper, which sometimes retains it very strongly, especially when the tissue has been sensitised for some days. It also serves to ensure the insolubility of the gelatinous compound of which the picture is formed. It is perhaps hardly right to say that it *fixes* the picture, inasmuch as this, being composed of gelatine already rendered insoluble by the action of the light, does not require to be fixed in the ordinary photographic sense of the term. After ten minutes or a quarter of an hour in the alum bath a final washing in clean water completes the operation, when the picture may be hung up to dry.

If small pictures are desired to be finished with a very high glaze, they may be "enamelled" in the following manner:—Glass plates, having been carefully cleaned, are coated with plain collodion and allowed to dry. It is seldom necessary to take the precaution; but, if thought desirable, the plates, previous to being coated with collodion, may be polished with a little talc or French chalk, or may be rubbed over with a little very dilute solution of ox-gall in spirit. The pictures, after removal from the final washing water, are laid face downwards upon the plates so prepared, and brought into contact with them with a soft squeegee. When dry they may be stripped from the glass, or they may previously be backed with an extra thickness or so of paper and again dried, before their final removal.

Two or three precautions should be taken in conducting the above operations:—

1. That the water used for making the attachment of the tissue and transfer paper be as cool as possible. If, in the summer time, this water be allowed to reach the temperature of 65° or higher, there will be great danger of failure, the picture becoming covered with innumerable minute bubbles of air very shortly after the commencement of the development. These, as the development proceeds, run one into the other, so that eventually large blisters are formed, which break, and bring away the picture in large pieces. The introduction of a piece of ice into the water speedily reduces the temperature to a sufficient degree.

2. That the *tissue* be not allowed to remain in the water previous to transferring for more than a very short space of time. When it is first immersed it has a tendency to curl inwards, and after a few moments it lies perfectly flat in the water; but, after the lapse of a minute or two, the tendency of it will be to curl the reverse way, or with the pigmented side outwards. It must not remain till this occurs, or it will not adhere to the transfer paper except with difficulty, and then only by means of considerable pressure and energetic use of the squeegee. I have said that the "tissue" should not remain in this water long, but this does not apply equally to the transfer paper, which *may* be immersed for some minutes, although, except in the case of thick drawing-paper or enamelled paper, it is seldom requisite.

3. That the water used for transferring should be *clean*. By this I do not mean that the presence of bichromate of potash dissolved out from previous papers is at all objectionable; but particles of dust, fragments of tissue detached from the edges of other sheets, and any solid matter whatever must be avoided, lest, in drawing out the papers, any such particles may be carried out of the water between the two surfaces, in which case they would remain permanently under the surface of the picture, or would cause holes to form during development. JOHN A. SPENCER.

A NEW THEORY OF THE SOLAR SPECTRUM.

SINCE the invention of the spectroscope, and its application to the study of the solar spectrum, the dark lines in the latter have been considered as absorption bands, caused by a layer of ignited metallic vapours, which surrounded the photosphere of the sun and changed the luminous and continuous spectrum of the photosphere into one covered with a multitude of dark lines, corresponding with the bright lines which we can produce by the combustion of various metallic substances.

Professor Henry Draper (observes the *Scientific American* of the 18th inst., from which we are quoting) now comes forward with a series of experiments and deductions from the same, and proves that we must change this theory and form another conception, namely, that the solar spectrum consists also of bright lines and bands superposed on a less luminous background of continuous spectrum. Such a conception, combined with observations in regard to these bright lines, opens the way to the discovery of metalloids, sulphur, phosphorus, selenium, chlorine, bromine, iodine, fluorine, carbon &c., the lines of which thus far have not been discovered in the solar spectrum. At the same time many of the dark lines, not thus far accounted for, may be due to being merely intervals between very bright lines.

That an incandescent gas in the solar atmosphere should *not always* be subject to the law that it absorbs rays of the same refrangibility as it emits may, at first sight, be difficult to understand. But the fact is, the substances thus far investigated in the sun have been metallic vapours, to which, according to our present knowledge of chemistry, hydrogen also belongs. The metalloids may, and probably do, behave differently. The intensity of the light, from a great thickness of incandescent hydrogen, overpowers the effect of the photosphere; and instead of throwing a shadow of the rays of the same refrangibility it increases the luminosity. It is as if a person looked through a yard thickness of ignited sodium vapour to a candle flame; he would see no dark sodium light, but a bright one, while looking at a very bright flame he would see the comparatively dark sodium lines.

This would necessitate the supposition that some incandescent gases could give out more light than other substances in the sun, and why not? Has not Huggins shown that, in the outburst of the star τ *Coronæ Borealis*, hydrogen could give bright lines on a bright background of a similar nature to the background of the solar spectrum?

It is evident that bright lines on a less bright background make, to ocular observations, not so much impression upon the mind as the dark lines, and this is the simple reason that, thus far, they have been overlooked. If, however, the solar spectrum is photographed, such lines become very prominent; and the photograph being a permanent record, they may be easily compared with bright lines photographed from other spectra—such as those of air, oxygen, nitrogen, carbonic acid, &c.—illuminated by means of the electric spark.

Frauenhofer, who, about a century ago, first discovered the dark lines of the spectrum, which, at the present day, are named after him, also discovered that these lines are different when the light of some of the prominent fixed stars is investigated; and Berzelius, in remarking this, said in the beginning of this century that the study of these lines would, at some future day, lead us to the knowledge of the cause of the development of light in the heavenly bodies. This was a genuine prophecy, of which the world now begins to see the realisation.

[See Professor Draper's communication in another portion of this number. We may here add that the photograph of the solar spectrum, by which Dr. Draper's communication was illustrated, may be seen at our office by those interested in the subject who may choose to call for the purpose.—EDS.]

British Association.

PLYMOUTH MEETING, 1877.

HE forty-seventh annual meeting of the British Association for the dvancement of Science was this year held at Plymouth.

For the benefit of such readers as may not be aware of the precise ature of the British Association and the scope of its operations, we hall prefix our notice of the late meeting with a brief account of he body itself. The Association was formed by the late Sir David rewster, Professor E. Forbes, Professor Philips, and others, the bject being "to give a stronger impulse and a more systematic irection to scientific inquiry; to promote the intercourse of those ho cultivate science in different parts of the British empire with ne another and with foreign philosophers; to secure more general ttention for the objects of science, and the removal of any disdvantages of a public kind which impede its progress." The ssociation meets annually, for one week, commencing on a Vednesday. The place of each meeting is appointed by the eneral Committee two years in advance; and the arrangements r it are entrusted to the officers of the Association.

At the first meeting (at Plymouth this occured on Wednesday vening, the 15th inst.), the whole of the members are usually resent to hear the opening address of the President for the year. 'ormerly this address consisted of a well-digested *résumé* of the cientific progress made during the previous twelve months; but f late years—and notably so on the occasion of the Plymouth neeting—its theme has been to a large extent confined to a pecial subject, the precise nature of which may long previously be uessed at from a knowledge of the scientific pursuit followed r of thought indulged in by the president-elect. On the morning ollowing the various divisions of science are represented in sectional neetings, each separate organisation being presided over by its wn president and managed by its committee and officers. These ections are familiarly distinguished by the first seven letters of he alphabet—Section A, for instance, representing Mathematical nd Physical Science; Section B, Chemical Science, and soforth. journal containing a programme of the sectional proceedings or each day is published in the morning, by which members, upon lancing over the lists of papers to be read, may select any section vhich for them possesses the greatest attractions.

The cities or towns selected for the meetings are, in succession, ituated widely apart from each other. Last year, for example, t was held at Glasgow, and previously, at the usual intervals of welve months, at Bristol, Belfast, Bradford, Brighton, Edinburgh, c. The meeting of next year is appointed to be held at Dublin, nder the presidency of Mr. W. Spottiswoode, F.R.S., Treasurer f the Association, and in 1879 at Nottingham. The city of York, vhere the first meeting of the Association was held in 1831, as invited the Association to hold its jubilee meeting there in 881.

Plymouth, where the recent meeting has been held, is a locality possessing attractions of a peculiar and altogether unique character. Situated, together with its companion boroughs of Stonehouse and Devonport (forming the well-known "three towns") on a narrow yet deep bay, between the rivers, or, to speak more correctly, the estuaries of the rivers Plym and Tamar, the harbour of Plymouth affords shelter to numerous ships of war, emigrant, and other vessels of arge tonnage, where they lie in perfect safety, protected from the billows of the Atlantic by a breakwater about a mile in length, which was built, at a cost of a million and a-half sterling, partially across the mouth of the bay, leaving a passage at each end of over a mile in width. The naval wealth protected from the sea by the breakwater, and from possible hostile nationalities by numerous fortifications which bristle right and left and everywhere around, is great, the various Government establishments, including dockyards, victualling yards, and other stores being very extensive. On the west side of the sound or bay is situated Mount Edgcumbe, on which is erected the seat of the earl of that name. By almost universal consent Mount Edgcumbe is credited with being the most charming spot in England. Seen from Plymouth it forms a perfect picture—from the rocks at its base, against which the sea dashes, up through its irregularly-ascending slopes, embellished with groves, terraces, dells, ruins, and every other feature that can delight the lover of Nature in her finest forms. It reflects the highest credit upon the taste of the admiral who commanded the great Spanish armada that he formed the determination to retain this place for himself in return for his services in bringing the English power into subservience to that of Spain—an intention which is known to every student of history to have been frustrated by Sir Francis Drake, who defeated the Armada.

The finest view of Plymouth and its neighbourhood is obtained from any of the eminences on Mount Edgcumbe, but the scene is so very extended and is of such an essentially panoramic character that an ordinary photographic camera would prove quite inadequate for its photo-pictorial representation. It is true that we have seen numerous very fine photographs taken from this elevated standpoint, but they all signally fail in conveying an accurate idea of the nature and extent of Plymouth with reference to its surroundings. Nor is this to be wondered at; for, as we determined by actual geodetical measurement, the angle of view requisite to include the whole of Plymouth up to and inclusive of the estuary of the Tamar is a hundred and twenty degrees on the base; hence it follows that to render justice to such a scene nothing short of a pantascopic camera, which readily includes such an angle on a flat plate, can be employed. But there are so many fine subjects for the camera in the vicinity of Plymouth that a skilful landscape photographer would be sure to find ample scope for the exercise of his artistic proclivities for several weeks, even if he worked continuously. This leads us to observe that Plymouth, or its neighbourhood, bears a paternal relationship towards many artists whose names are "familiar as household words" in art circles, and among which are included those of Sir Joshua Reynolds and Sir Charles Eastlake. We may further observe that portrait photography has received a very high degree of development in Plymouth, some of the examples there to be seen, especially in carbon, being of so excellent an order as to make dwellers in the metropolis blush for the low estate of photographic art there as compared with that in Plymouth. If a walk be taken through George-street in the latter town and Regent-street in London, the comparison arising therefrom will quickly convince the most sceptical as to which of these bears the palm for the highest class of work.

As in late years, photography as a branch of applied science, or even as an art, was totally unrepresented at the Plymouth meeting, although, as will be seen from what is to follow, a few allusions were made to services which it is competent to render. It is probable that if the President had been a student of physics to a greater degree than he is much interesting matter relating to the chemical changes produced by light might have found a place in his address; but Professor Allen Thomson contented himself with broadly unfurling the previously half-raised flag of *evolution*, and, from all that has transpired in connection with the rearing of such a standard before the British Association, it may now be assumed that the members in the aggregate have endorsed the promulgation of that, at one time, heretical doctrine.

Among those present at the meeting, whose names are more or less familiar to photographers, were Mr. James Glaisher, F.R.S., Captain Abney, F.R.S., Messrs. Le Neve Foster, J. D. Marwick, Huggon, A. L. Henderson, W. H. Harrison, H. Greenwood, and J. T. Taylor.

The accommodation in the reception room was exceptionally bad—the worst, in point of fact, that we have ever seen; and the strain upon the lodging capacity of the town and neighbourhood greater than it appeared able to bear, seeing that, as recorded in the daily papers, and as, unfortunately, experienced by those who arrived late, lodgings were at a premium on the first day of the meeting.

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SECTION A.—MATHEMATICAL AND PHYSICAL SCIENCE.

Friday, August 17, 1877.

ON A METHOD OF SHOWING THE SUN'S ROTATION BY SPECTRUM PHOTOGRAPHY.

By Captain ABNEY, F.R.S.

THOUGH it is now generally admitted that the approach or retrocession of the stars towards our system can be observed by means of the displacement of the absorption lines of their spectra towards the most- or least-refracted end of the spectrum, yet, in the minds of some, there still exists a lingering doubt of the truth of the process employed. If, however, the displacement of the absorption lines, due to the rotation of the sun, can be shown to agree with the theory, all doubt must be removed. Huggins, Christie, and Young have proved the solar rotation to their own satisfaction; but with the methods employed there might be some danger that the displacement noted was due to some other cause. I have made some experiments lately in the same direction, which have, I think, been fairly successful in conclusively demonstrating the truth of the problem, the manner of which I will briefly describe:—

A condenser was prepared by cutting a lens across the centre and mounting the two halves side by side, in such a manner that the two images formed by the sun were tangential one to another, the tangent being parallel to the horizon. The light from the sun was thrown into this condensing arrangement by means of a heliostat having a mirror silvered on the surface; and the images were brought to a focus on the slit of a spectroscope, the point of contact of the two suns occupying a position half-way down the slit. To the spectroscopic apparatus was attached a camera and lens of some six or seven feet focal length, and the spectrum was thus formed on a sensitive plate. When the north and south points of the sun's image were tangential, evidently no displacement of the two portions of the spectrum formed by the upper and lower halves of the slit should be seen; whereas, when the equatorial portions of the images were in contact, the displacement of the lines should be that due to double the rotation, since the eastern limb should be receding and the western advancing.

Thus, if photographs were taken in the morning, at noon, and in the evening, the apparatus remaining in the same position, it is evident that a displacement of the lines in the top half of the spectrum should first be noted in one direction; next, there should be no displacement of the lines, and, finally, there should be a displacement of the lines in the top spectrum in the reverse direction to that first noted. On the two separate occasions on which I have devoted a day to this subject I have found such to be the case. In the first I was using a refraction apparatus of considerable power; in the second I employed a diffraction grating, by Rutherfurd, of over 17,000 lines to the inch, which Mr. Lockyer kindly placed at my disposal. The fourth order of the spectrum in the last case was employed, and that portion lying about the H lines was taken to test the method. I have not had sufficient time to measure the displacement of the lines, but as far as I have gone the truth of the method first employed by Huggins, as applied to the stars, is fully borne out.

Tuesday, August 21, 1877.

ON A BINOCULAR MICROSCOPE FOR HIGH POWERS.

By J. Traill Taylor.

The binocular system described by Mr. Taylor was (he said) the result of numerous attempts made by him to devise means for obtaining binocular photographs by the high powers of the microscope. It was illustrated by diagrams, and will appear *in extenso* in our next number.

Captain Abney, in proposing the thanks of the Section to Mr. Taylor, alluded to the great difficulty he (Captain Abney) and others had experienced in obtaining binocular microphotographs. There could be no doubt that by the system introduced by Mr. Taylor such difficulties would be obviated in future.

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Section D.—Biology.

Thursday, August 16, 1877.

In the anthropological department of this Section the Vice-President, Mr. Francis Galton, F.R.S., in his opening address, spoke of the value of photography as a means of obtaining accurate measurements of individuals. He said:—

Let us now suppose that, by one or more of the methods I have described or alluded to, we have succeeded in obtaining a group of persons resembling one another in some mental quality, and that we desire to determine the external physical characteristics and features most commonly associated with it. I have nothing new to say as regards the usual anthropometric measurements, but I wish to speak of the great convenience of photographs in conveying those subtle but clearly visible peculiarities of outline which almost elude measurement. It is strange that no use is made of photography to obtain careful studies of the head and features. No single view can possibly exhibit the whole of a solid, but we require for that purpose views to be taken from three points at right angles to one another. Just as the architect requires to know the elevation, side view, and plan of a house, so the anthropologist ought to have the full face, profile, and view of the head from above of the individual whose features he is studying.

It might be a great convenience, when numerous portraits have to be rapidly and inexpensively taken for the purpose of anthropological studies, to arrange a solid framework supporting three mirrors, that shall afford the views of which I have been speaking, by reflection, at the same moment that the direct picture of the sitter is taken. He would present a three-quarter face to the camera for the direct picture, one adjacent mirror would reflect his profile towards it, another on the opposite side would reflect his full face, and a third sloping over him would reflect the head as seen from above. All the reflected images would lie at the same optical distance from the camera, and would, therefore, be on the same scale, but they would be on a somewhat smaller scale than the picture taken directly. The result would be an ordinary photographic picture of the sitter surrounded by three different views of his head. Scales of inches attached to the framework would appear in the picture, and give the means of exact measurement.

Having obtained drawings or photographs of several persons alike in most respects but differing in minor details, what sure method is there of extracting the typical characteristics from them? I may mention a plan which had occurred both to Mr. Herbert Spencer and myself, the principle of which is to superimpose optically the various drawings, and to accept the aggregate result. Mr. Spencer suggested to me in conversation that the drawings reduced to the same scale might be traced on separate pieces of transparent paper, and secured one upon another, and then held between the eye and the light. I have attempted this with some success. My own idea was to throw faint images of the several portraits, in succession, upon the same sensitised photographic plate. I may add that it is perfectly easy to superimpose optically two portraits by means of a stereoscope, and that a person who is used to handle instruments will find a common double eyeglass fitted with stereoscopic lenses to be almost as effectual and far handier than the boxes sold in shops.

In illustration of what I have said about photographic portraits, I will allude to some recent experiences of my own in a subject that I have still under consideration. In previous publications I have treated of men who have been the glory of mankind. I would now call your attention to those who are its disgrace. The particular group of men I have in view are the criminals of England, who have been condemned to long terms of penal servitude for various heinous offences.

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SOIREES.

As usual, there were two *soireés* held during the Plymouth meeting in the new Guildhall, and proved, perhaps, the most attractive features connected with the recent meeting. The first *soirée* took place on the invitation of the Mayor and Corporation of Plymouth, instead of that of the Association. This was an unusual occurrence. The Mayor received the company. He was attired in his official robes, aud attended by the Corporate regalia. Nothing of special interest to photographers was exhibited, if we except a fine collection of photographs of local scenery exhibited by Mr. William Heath and Messrs. Groom and Co. There were also exhibited by Messrs. Browne and Co., patent agents, London, a new apparatus designated *Prince's Patent Kaleidoscope Album*, of which we shall give an account in our next. Bell's telephone was in active operation at the second *soirée*, and proved a great attraction,

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RAPID COLLODION.

M. Gougenheim has sent to the Photographic Society of France a number of bottles of a rapid collodion, of which the following are the formulæ:—

Collodion.

Ether	6,700 parts.
Alcohol	5,955 ,,
Cotton	1 part.
Double iodide of potassium and cadmium	46 parts.
Iodide of ammonium	30 ,,
Iodide of cadmium	20 ,,
Bromide of cadmium	22 ,,

Developing Solution.

Filtered water	500 parts.
Sulphate of iron	50 ,,
Sulphate of copper	10 ,,
Acetic acid	17 ,,
Alcohol	10 ,,

Silver Bath.

Neutralised at seven per cent.

Intensifier.

Distilled water	250 parts.
Pyrogallic acid	3 ,,
Acetic acid	10 ,,
Alcohol (36°)	10 ,,

Solution of Nitrate of Silver for Intensification.

Distilled water	50 parts.
Nitrate of silver	1½ part.

—*Bulletin Belge.*

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ON THINGS IN GENERAL.

One reads about business being dull all over the kingdom, of trades and professions losing money, and photographers, above all, complaining that "things are bad," and, when they have a chance of mending, the weather on the whole is so bad that sitters do not turn up. Possibly they are not aware of the reason. I hasten to tell them. The sun is all gone to France, though I cannot say much of its power there, of which more anon.

M. Charles Bardy, by means of the attractive power of a glass covered with chrysoïdine collodion, is represented to have stated that for twelve months he has never had a single day without a supply of sunshine for some hours upon this wonderful plate of glass. Happy France! Happy M. Bardy! Let England have her fogs and rains and clouds; this favoured spot has perennial streams of fulgent light at command for every purpose of art and life. What a fortune to a photographer must such a place be, if only the sun were like our own! But either it is not so, or he has discovered a wonderful substance which every one should obtain. The whole story smacks of *elixir vitæ* and the philosopher's stone to an unusual degree. This wonderful window, with its wonderful coating, exposed to its wonderful sun, did not give way to the action of light one iota. The aniline series of colours are not noted for their persistence when exposed to light; but here is an unparalleled exception. Manufacturers and others take note.

It is evident that special spots in this universe are favoured with light of a nature peculiar and distinct, having characteristics quite different from those it usually bears. Take, now, Mr. Brooks, who goes down into a crypt, and such is the light that it enables him to take a moist emulsion picture with a rapidity three times as great as wet collodion would have permitted! What will the scoffers say to that? No stains, no fog, no oyster-shells, but a beautiful negative rather overdone—that is the beauty of these new quick plates. We generally read that they are a little over-exposed.

But wet collodion may hold up its head yet. One of its enemies is to be cast to the ground—oyster-shell markings. Much has been written lately about them; but, Eureka! It is all the *aurora borealis*. It is not dirty plates, greasy fingers, or imperfectly-cleaned carriers; it is all along of electricity, galvanism, and the northern lights, together with a little actinism and atmospheric condition. *Vide* correspondence in THE BRITISH JOURNAL OF PHOTOGRAPHY, page 348.

I should like to know how long it will be before we hear the last of the expansion of paper and its connection with want of fidelity in portraits. I read that—"The expansion is so remarkable that even people notice it by comparing two pictures. Though the whole matter is a fault, under certain circumstances it is an advantage. Very often we find persons of excessive meagreness who wish to appear in their pictures a little stouter, or stout persons who like to appear in their pictures more slender. By the above fault it is in our power to gratify their wishes." How is it possible that anyone can imagine that by printing with the paper in one direction instead of another any difference perceptible to the ordinary sitter could be seen?

With regard to the question of cutting pictures:—Mr. Gihon has been having something to say lately that I can't agree with at all—"The cutting of a print after it is removed from the pressure-frame, and before it is toned, cannot, I think, be too strongly advocated. There is every reason in favour of the plan, and none against it that I know of." Now I will tell him of a very grave objection. If the prints are washed at all well their corners are quite round when dry, and also the integrity of the edge is destroyed, the sizing being removed. The effect is not visible until they come to be mounted, and then, in the case of vignettes or prints with white grounds, the edge is quite dirty-looking after mounting, owing to the mounting material soaking in and causing the usual opaque appearance to be destroyed. I entirely agree, however, with Mr. Gihon's remarks as to the care required, and also when he says:—"An artist's anxiety about his productions is never at an end—no, not even when they are lost to his sight, and become the property of his customers." He is quite right. The other day I saw in an album a beautiful portrait ruined by the bronze powder which had fallen from an adjacent picture, no such so-called gold having at all been used in the faded picture. Why do the manufacturers print in this dangerous material still? Is it that their customers do not care, or are ignorant yet, notwithstanding all that has been written, of the deleterious properties of the bronze? If so, is it not the duty of the manufacturers to call attention to it, as their mounts cannot be assumed to be perfect in all respects?

I was particularly struck, in view of Mr. Richard Brown's recent communication, with the remarks in the *Notes from the South of France* in the Journal for August 10. The writer was struck with the beauty of the pictures exhibited by a local photographer; but his wonder disappeared when he saw the well-known name of Fritz Luckhardt stamped upon their faces. The immorality of such proceedings as this have been already alluded to by Mr. Brown, who very properly published a letter he had received of such unblushing effrontery as is not often, it is to be hoped, seen. But, alas! such a hope is vain, I am afraid. The practice has always been carried on, and now it is fostered and encouraged by one of the largest photographic material dealers in the kingdom, who, by means of the travellers, actually offer to photographers specimens in portraiture and landscapes of the highest style of photography, and these pictures may be seen in many a third-rate photographer's show-cases and exhibition rooms. I do not care to characterise such conduct. It will be called "enterprise," no doubt. The enterprise I like to see is that shown by the Stereoscopic Company in sending a photographer to the seat of war. This is something like pluck, as also is that of the Editors of this Journal securing the services of the gentleman in the literary department.

I have been wondering for a week what motive could possibly have actuated the writer of the article on *Light and Shade*, communicated to the Boston Photographic Society. I fail to glean a single idea out of the whole *fanfarronade* of words and talk, and the writer talking of art and professedly giving æsthetic teaching has not even mastered the difference between light and shade and *chiaroscuro!*

FREE LANCE.

PHOTOGRAPHY IN COURT.

CROOKENDEN *v.* HAWKE.—This was a case to which we attach a good deal of importance, inasmuch as it exemplifies the working of a system which we should like to see more generally adopted by our professional readers. It appears that Mr. Hawke, the well-known photographer, of Plymouth, several years ago successfully established the system of prepayment for portraits, although it met at first with considerable opposition, and to the carrying out of this system he has since rigidly adhered. The plaintiff, an artillery officer, a short time ago sat for his portrait in the regular way. Proofs, having been sent, were brought back by the plaintiff, who objected to them and demanded a return of the amount paid. To this Mr. Hawke objected, but offered to take another negative, although he did not admit that there was anything amiss with that already taken; but to this Captain Crookenden would not agree, insisting upon having the money returned. A county court summons ensued, and the case was heard on the 21st inst. before Mr. Beare at the Stonehouse County Court, where plaintiff stated his grievance. Upon making the admission, in reply to Mr. Hawke's solicitor, that he had been offered a "re-sit" and had declined it, his honour told him he had no case, and that if such objections were held to be valid no one knew where the end would be. Judgment for the defendant, with costs.

LOUIS *v.* THE LONDON AND NORTH-WESTERN RAILWAY COMPANY.—At the last sitting of the session of the Bloomsbury County Court this case came on for hearing before Mr. Judge Russell. Plaintiff, a photographer, of Hampstead-road, sued the company to recover the sum of £4 odd for damage done to some photographic apparatus in the course of transit, owing to the alleged negligence of the defendants' servants. From the plaintiff's statement it appeared that he had been photographing some scenery in Cheshire, and returned from Nantwich station to London, taking his lenses with him, but leaving his camera, box of plates, and accessories in charge of the guard in the van. He had seen them safely deposited, but when he arrived at his destination two large negatives were found to be cracked so as to render them useless and the work he had done abortive. He was obliged to take another journey in order to obtain fresh negatives, and he brought the present action to recover for the loss and inconvenience he had been put to.—The plaintiff's operator was called, and said that the plates were safely packed in cases on being put into the station at Nantwich, and could not have been injured had ordinary care been exercised.—In cross-examination the plaintiff said that when he reached London he took a four-wheeled cab to his destination, and did not examine the contents of the packages when he arrived at Euston-square, nor did he do so till the following morning, when they were discovered to be broken.—Mr. Hinton, the company's solicitor, urged that the plaintiff had no case whatever, as he had failed to prove that the damage had been caused by any negligence on the part of the company, and it was more probable that the negatives had been broken in transit by the cab, or by loading or unloading them carelessly by the driver. The Judge concurred in the view taken by Mr. Hinton, and ruled in favour of the company, with costs.

Correspondence.

WASHED GELATINE EMULSION.

To the EDITORS.

GENTLEMEN,—Referring to the article in THE BRITISH JOURNAL OF PHOTOGRAPHY of this day's issue with regard to our method of extracting the soluble or crystallisable salt from a gelatino-bromide emulsion by means of alcohol, it has occurred to us that it will be well to caution your readers to avoid the use of *common* methylated spirit for the purpose. A good quality free from gum may be had at 2s. 6d. per pint, and we counsel the use of this or of pure unmethylated alcohol.

The extra expense attending the employment of our method is as nothing compared with the expeditious and perfect manner in which the operation is performed.

We claim by the use of Nelson's No. 1 photographic gelatine and in the use of alcohol for the extraction of the waste salt a saving of *at least* eight hours, and this, in the majority of instances, will constitute all the difference between success and failure during the heat of the summer season.

We would also suggest that it is better first to precipitate a small quantity of the emulsion and test for the presence of free bromide or free silver nitrate, and in case the latter should be found to add a trifle more bromide and digest the bulk a little longer before precipitating it.—We are, yours, &c., WRATTEN AND WAINWRIGHT.

38, *Great Queen's-street, Long-acre, W.C.,*
August 17, 1877.

POIKILOGRAPHY.

To the EDITORS.

GENTLEMEN,—With reference to your remarks on the subject of poikilography in the last number of your Journal, permit us to reply to the question you there ask.

These pictures are really produced by clever artists, and we think you will agree with us when we say it testifies highly to their skill that so little artistic work appears to exist.

The process is applicable to all kinds of photographs as well as to reproductions of ancient masters, and it will afford us pleasure if any brother photographers will call, either here or in Brighton, and see these examples of the most recent development of the union between art and photography.

If you will favour us with a visit you will find that we have not been slow in giving practical effect to your suggestion, and that we have now applied the process to ordinary portraiture.—We are, yours, &c.,

13 *and* 14, *Pall Mall East*, *London*. LOMBARDI AND CO.
August 20, 1877.

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ON THE CLEANING OF OPAL GLASS.

To the EDITORS.

GENTLEMEN,—Noticing a few remarks on the cleaning of opal glass, in which there appears to be a difficulty among photographers, permit me to lay before your readers a method I have long practised with great success, in the hope that it will be of some service to those troubled with the same.

Having obtained the opal I want to clean, I place it on a bench near a water tap. I then pour on it a small quantity of Calais sand, and over that enough nitric acid to saturate it. I next get a round stick with a piece of rag wrapped round the end of it, and rub the opal vigorously for a few seconds. I now pour water on the opal, rubbing it all the while until it is quite clean. I find the above to answer every purpose, as it brings the opal beautifully white and free from any stains whatever.—I am, yours, &c., CHARLES C. BRADSHAW.
August 14, 1877.

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CARBON PRINTING.—EMULSIONS.—ALTERING THE FOCUS OF A LENS.

To the EDITORS.

GENTLEMEN,—The experiments in producing carbon enlargements by the solar camera, recently referred to by you, are not the first that have been made, for you may remember that I wrote to you two years ago giving my experience in this direction.

I observe that Mr. Bolton has been experimenting with emulsions. I may here state that I have been in the same track, but without arriving at any result worthy of noticing, further than finding that bromide or iodide of silver may be formed in glycerine, dialysed, and afterwards taken up by either collodion or gelatine. When used moist I have obtained visible impressions that need no development. The decomposition set up by exposure goes on till all detail is out, which takes from three to five minutes, no gallic, tannic, or pyrogallic acid being used. The exposure required for views in good light is fifteen seconds with a portrait lens, the stop used being $\frac{f}{10}$; an hour's exposure does not make the slightest difference. I wish to ask if this is anything new? If so, more about it in future. The formula is full of promise, although I may modify the proportions to advantage; and, further, I may here confess that I have mixed by the rule of thumb.

Will you please to tell me to what extent the focus of a portrait lens can be lengthened, and if it be possible to neutralise the focus of the back combination, or is there a limit at which I must stop? I find a plano-convex the best shape for reducing the focus, convex side to the back. Please to say what kind of a concave I should require in order to lengthen the back focus from ten inches to fifteen or sixteen inches. —I am, yours, &c., W. WESTON.
Swinton, *August* 15, 1877.

P.S.—My experiments have been conducted during a relay from the coal pits (I am a miner), through a severe attack of illness from which the mind is still weak and confused. Some years ago I thought to use carbon tissue in the camera for negatives, and I have not done thinking of it yet.—W. W.

[The investigations made by our correspondent, who, as he states, is an operative miner, reflects the highest credit upon him. In reply to his optical query: the forms of lens which we have employed with the best effect for lengthening the focus of a portrait combination is plano-concave, or concavo-convex, the flattest side being placed nearest the front lens. With respect to the other query: the late Mr. J. T. Goddard constructed an objective in which a plano-convex achromatic lens formed the front lens, and at a little distance from it a second combination which did not materially alter the focus of the front lens, but corrected its aberrations to such an extent as to allow of excellent photographs being taken. We write this append at a distance from home, and hence quote from memory; but, if we mistake not, an account of this lens, illustrated by a diagram, was published in our volume for 1869, a further illustrated account of it being given in our ALMANAC for 1870. We have also a recollection of publishing the fact of Mr. J. J. Cole having had such a combination in constant use, a peculiarity in connection with which was stated to be that several front lenses, each of different focus, were used in succession with the same back lens.—EDS.]

ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

⁂ In consequence of our absence from London, attending the meeting of the British Association at Plymouth, those correspondents whose letters have received no attention in the present number will please excuse us. Next week we shall bring up all such arrears.

EXCHANGES.—In our nex .

PHOTOLITHO.—Schlippe's salt (sulphantimoniate of sodium) may be obtained from Messrs. Hopkin and Williams.

W. H. J.—The gentleman whom you name has now got into the "sere and yellow leaf" as regards photography.

G. B. E.—To secure the best portrait of the lady, induce her to "give a side glance and look down." Then she will make a truly charming portrait.

SEMPER VIGILANS.—We have several times observed the peculiarity of which you speak. A very curious and instructive deduction might be made from it, but it would not be profitable to our readers if given in these columns.

X. Y. Z.—There is no better method of using collodion emulsion than that described by us abont two months ago. From the nature of the objections offered we plainly perceive that you have never yet attempted to prepare an emulsion plate. Give the process one trial, and you will then see how untenable are your objections.

A. B. T.—This correspondent asks—"Which is the brighter—a white-washed chimney or the blue northern sky against which it stands?"——In reply: it will be found that much more light will be radiated from a given area of the chimney than from the sky—a fact that may be demonstrated by photographing them, giving a very brief exposure, and observing how much denser the chimney is than the sky.

H. A. S.—The photograph bears some evidence of having been handled, during toning, by fingers which had been in contact with hyposulphite of soda. This would account both for the scum on the surface and for the lowering of the whites. Try the effect of toning with acetate of soda, a little common salt being added to the toning-bath, and do not allow too much white light to come into contact with the prints while they are being toned. It may also be well to slightly acidulate the sensitising bath.

OLD SUBSCRIBER.—A very good test subject for halation is the interior of a room the window of which is fitted with venetian blinds. These must be turned in such a manner as to obstruct about one-half of the light. The camera is now placed at the side of the room opposite to the window, and in such a position as to show the light of a bright sky between the laths of the blind. If a photograph of the window, taken under such circumstances, show the laths free from fog it may be accepted as a satisfactory indication that the plates are free from halation.

GEORGE H. SMITH.—It would certainly appear, from the indications described, as if the sensitising bath were about to "strike work" at last. We believe, however, that by subjecting it to to the following treatment it will be restored to its original state of excellence, for it is not a case in which we would counsel the precipitation of the silver:—Pour a portion of the solution (two gallons being too much upon which to operate at once) into a glass or porcelain vessel, and, by means of heat carefully and suitably applied, raise the temperature slowly to the boiling point, at which it must be retained from five to ten minutes. When cold, filter.

P. H. H.—This correspondent, having long experienced difficulty in obtaining density when using rapid Liverpool dry plates with ammonia and pyro. development, has tried the formula of Mr. H. J. Newton, in which "sal soda" supplies the place of ammonia. His experience is thus stated by him:—"I have tried about half-a-dozen stereo. plates this morning, using the sal soda developer as described on page 298, but have been unable to obtain a single satisfactory result. Every one of them flashed out as soon as the developer was applied, just like a wet plate and iron development; but, in attempting to get printing density, the whole picture was covered with a thin veil, giving it the appearance of an over-exposed wet plate. I have no doubt they would be easily intensified with acid pyro. and silver, but we are assured that it is easy to obtain full printing density with the developer alone. I wish to know how to proceed. I have used the exact formula given on page 298 in my experiments. It could not be over-exposure which caused the veiling of the picture, as I reduced the time from fifteen seconds to three."——In reply: it is quite possible that even the reduced exposure of three seconds may be too much, as we have no data given by which we can estimate the relation of the aperture to the focus. Even *three* seconds we know to be an over-exposure under some circumstances. We always find it best, when working with plates that, from whatever cause, do not intensify easily by the alkaline developer, to content ourselves with bringing out the detail in this manner, and having recourse to acid pyro. and silver for securing the requisite intensity. We refer our correspondent to a sub-leader on this subject in the present number, and also recommend him to greatly reduce the proportion of alkali in his developer.

RECEIVED.—Joseph Wake; J. Nicol, Ph.D., and other contributions. In our next.

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 904. Vol. XXIV.—AUGUST 31, 1877.

ON PRECIPITATING EMULSIONS.

In continuance of our remarks of last week we shall now proceed to make a few observations upon the precipitation of emulsions. We remarked in the course of our last week's article that it is a much simpler matter to precipitate plain pyroxyline than an emulsion, owing to the difficulty experienced, under some circumstances, in preventing either the partial separation of the bromide of silver and pyroxyline or the agglomeration of the precipitate into an almost solid mass, both of which prevent the proper re-emulsification of the product. There exist certain conditions—varying, no doubt, with different samples of pyroxyline—which conduce to success; and if these be mastered the remainder of the operation is as easy as in the case of pyroxyline. These, however, are mechanical difficulties and require merely mechanical treatment, the nature of which we have sufficiently explained upon previous occasions. Our present task is rather in connection with the chemical action of various substances upon the precipitate during the time of its formation.

The action of such substances is not confined to their so-called preservative or organifying power, as exhibited under other circumstances, but extends to the precipitated pyroxyline itself, irrespective of the silver portion of the emulsion, which is frequently rendered wholly different in character by such an addition. The true organifying effect is, indeed, masked by a secondary action, apparently of a mechanical nature, which operates upon the physical character of the emulsion.

The substances we spoke of last week in connection with precipitated pyroxyline were acids and alkalies; but these, except in very small quantities, are inadmissible when we come to treat an emulsion. Confining ourselves to the ordinary organifiers already in use we shall find a very wide range of effects are produced; in fact, we are inclined to believe that the action of the organifier at the moment of precipitation is more powerful than under any other circumstances. In the course of the experiments we have to record it must be borne in mind that, where an excess of silver exists in the emulsion before precipitation, a small quantity of nitric acid—two drops to each ounce of organifier—is used in the precipitation. Where the organifier is of such a nature as to form a precipitate with free silver, if unacidified, a large proportion of *acetic* acid is employed. In this case the proportion of acid may be increased to half-a-drachm to each ounce of organifier; and it is as well to slightly acidify the first two changes of water employed after the organifier has done its work.

The first series of substances examined included tannin, gallic, pyrogallic, and salicylic acids, both singly and in combination; but, owing to the large number of combinations which might be made, we shall confine ourselves to the individual effects of each substance. Tannin, in the presence of free bromide, aids materially in the production of a clean and easily-collected precipitate, even when a very small quantity of the solution is used in proportion to the bulk of emulsion; the product, when dry, shrinks into smaller compass, and is of a more powdery character than when water alone is employed. The colour of the pellicle is not changed, but the emulsion appears to possess a richer tint by transmitted light—a remark which applies equally to the dried film. In the matter of exposure there is little difference between the results obtained with and without tannin; but the image produced under the former circumstances, without exhibiting any general increase of density, is, perhaps, more brilliant without lacking detail, and partakes of the brownish-black colour with which tannin plates are usually identified.

Pyrogallic acid (strength one grain to the ounce of precipitative solution) does not appear to produce much effect upon the precipitation of the pellicle, but its action is distinguishable when we arrive at the development; the image is blacker in colour, slightly denser, and has a tendency to harshness. Gallic acid of the same strenth behaves in a similar manner as regards physical effect, but its action upon the image is totally different. The colour of the deposit is a peculiar brown quite unlike tannin, developing quickly, and with a peculiar softness apparently arising from over-exposure, which, however, is easily proved not to be the cause. Pushing the development adds only to the general flatness of the result, but the appearance is very deceptive; and what seems to be a thin, poor negative is frequently found to possess great light-arresting power. Salicylic aicd exhibits no special peculiarity beyond a slight change in the colour of the deposit to a yellowish-brown.

None of these changes are very decidedly marked, with the exception of gallic acid; but, if the emulsion operated upon contain an excess of silver, the various substances come more strongly into play. The pellicle when dried has a dirty appearance, as if partly decomposed; but this does not interfere with its working powers—at least, when newly dissolved, or for some time after solution. Tannin produces a brown discolouration; gallic and pyrogallic acids a slaty colour; and salicylic acid a dirty yellow. In the matter of density a very great change is effected, especially in the case of gallic acid, pyro., tannin, and salicylic acid, following in the order named. With gallic acid very great density is readily attained; but, owing to the extremely non-actinic character of the deposit, the results are very liable to be deceptive. Pyro. gives great density in the high lights, but is not uniform, the tendency being to produce violent contrasts. Tannin and salicylic acid seem to be the most generally satisfactory. Probably the best result is to be obtained from a mixture of two or more of the substances named, in such proportions as to secure the advantages of each—as, for instance, gallic acid and tannin—the one to confer density, the other to curb the too great tendency to softness. Pyro. appears to be too energetic, while salicylic acid offers no advantage over tannin.

The next series examined included infusions of tea, coffee, catechu, hops, and one or two others which presented no features worth recording. The first two offer a ready means of preparing an organifying precipitant at the shortest notice, and are worthy of mention on that account. Tea gives a nice, clean precipitate, but produces a minimum effect upon the density and general properties of the image. Coffee is, perhaps, the most satisfactory of any of the substances we have tried when used alone, and may be modified by the addition of any of the others as may be desirable. Catechu exhibits the properties of tannin in a mild form, but, except in the colour of the image, which is yellowish-brown, does not present any distinctive features. The infusion of hops gives a soft, harmonious image, but does not differ materially from a weak tannin solution.

We next turned our attention to an entirely different class of substances, of which we may mention sugar, glucose, dextrine, and gum arabic, none of which appear to exert any influence on the final result except in the presence of free silver. Their action upon the precipitation, even in the weak solutions in which we employed them—ten grains to the ounce of water—is rather unfavourable, as they seem to incline the larger particles of the precipitate to mass together and the smaller to remain in suspension; this renders the operation of washing difficult, and entails a slight loss of material.

Ordinary white sugar, though usually regarded as a neutral substance, appears to exert a slight restraining action upon the emulsion, enabling it to withstand the action of the developer for a considerable time without fogging. Glucose, on the other hand, when unrestrained by acid exhibits an opposite tendency, it being almost impossible to develope an image free from fog, the half-tones also being thick and heavy. Combined with acetic acid it gives an image clean and vigorous, but inclining to heaviness unless great care be exercised in order to preserve the delicacy of the half-tints. Honey and acetic acid behave in a different manner again, giving a rich, clean deposit, with no thickening of the half-tones. Gum arabic yields a delicate image abounding in detail, but very difficult to intensify, while dextrine has apparently no action whatever.

We had hoped to secure some advantage from the use of gelatine or albumen applied in this manner; but have, so far, been wholly unsuccessful. In using gelatine it is necessary to resort to heat in order to retain it in solution, or else to dissolve it in sulphuric or acetic acid, none of which conditions appear to be favourable to the production of a good emulsion. Albumen is precipitated with the pellicle, either by free silver or by the solvents alone, and, though it does not interfere with the appearance of the precipitate, it is found, upon re-emulsifying it, that the albumen exists in coarse clots, either as albumen or albumenate of silver, which entirely ruin the quality of the film. We are speaking now of albumen by itself. We are aware that a mixture containing albumen has been recommended for this very purpose; but in that mixture the albumen is probably held in suspension as a very fine precipitate and not in solution, which will materially alter the result.

In conclusion: we have gone over the list of substances likely to be of use in this connection, and, while giving the results of each upon the character of the emulsion and resulting image, we may say that in no instance can we record any increase of sensitiveness. In some cases—notably with gallic acid and gum arabic—first appearances would indicate a gain in this respect, while in others the opposite opinion would prevail; but, after carefully testing them, we have arrived at the conclusion that the gain or loss is in those cases imaginary.

METHYLATED SPIRIT.

A foreign operator coming to England is usually much struck with the great difference in price between some of the chemicals of this country and his own—notably alcohol and ether; and it is rather difficult to explain to him the difference between pure and methylated alcohol. When at last he does learn that the offensively-smelling liquid owning the latter name has been purposely made so nauseous for excise purposes, a meaning shrug gives a good idea of his opinion of the matter. And indeed it does appear at first sight monstrous that a carefully-purified chemical such as pure spirits of wine should be so treated merely upon a question of excise; but in this case the innocent suffer for the guilty, the object in ordering the addition of the impurity having been a double one—firstly, to make it so utterly nauseous as to be undrinkable by the most ardent dram-drinker; and, secondly, to render the addition incapable of extraction.

It is now over twenty years since, upon the representation of varnish-makers and other manufacturers, Parliament consented to allow the remission of the duty upon spirits of wine employed in manufacturing processes, adopting the expedient of spoiling it for potable purposes by the addition of one-ninth of its bulk of wood naphtha, the preamble of the act stating it to be "expedient, with a view to promote the advancement of the arts and manufactures of the United Kingdom, to allow spirits of wine to be used duty free in the processes thereof." The permission was fenced round with so many restrictions that, though for manufacturing purposes the new act was a great boon, small consumers could not get the entire benefit of its provisions. Its real usefulness may be seen when it is considered that, at the present time, it is possible to obtain methylated spirit at about one-sixth of the cost of the pure material, the saving being in the remission of the duty.

There was at one period a danger of this act being repealed, owing to its evasion, by unscrupulous traders, by so mixing and disguising the flavour of the spirit as to render it potable, and, still further, to brave the authorities by calling the mixtures "gindee," "brandee," &c.; but another act was passed with stringent provisions against this sophistication, a fine of one hundred pounds being the punishment for the offence, and at the same time greater obstructions were put in the way of retailing the material. Two further acts were passed, and sundry excise orders on the subject issued, till at last only the professional mind could exactly state what was the law upon the matter; and it is with some view of letting our readers understand what it is that we write.

Methylated spirit may be bought in two ways—either pure (if it be permissible to use the word in this connection) or mixed with some resin in the proportion of three ounces to a gallon—shellac, seedlac, and sandarac being the resins allowed. When so mixed it is sold under the designation of "finish." For photographic purposes (except for varnish) this addition renders the spirit useless, and when the unmixed is required the purchaser should specially so state, as the dealer is very apt to give "finish" whichever is asked for, owing, in the first place, to the fact that to the bulk of purchasers the one is as good as the other, and, secondly, a more cogent reason that a license costing ten shillings is required before the pure methylated spirit can be legally retailed, while it is not required for selling "finish." The sum may be thought too small to stand in the way of its sale; but it is the fact that many chemists and others who retail the spirit do not possess a license, and so can only sell "finish." To some extent this is accounted for by the fact of its not being generally known, even among chemists, that the two guineas formerly required for a license has been commuted to one-fourth that amount. If any doubt be felt as to whether any resin is dissolved or not in the sample purchased, it is easily cleared by adding a few drops of the suspected spirit to a little water, when a milkiness ensues if lac or sandarac have been dissolved.

Our readers may remember a process of Mr. Eschwege's (which was patented) for the purpose of removing the smell from wood naphtha, &c. It was employed in "cleaning" the methylated spirit. It was so far successful, with other processes also, in its object, that a spirit which might easily be made potable was produced, and a fresh act of parliament was passed rendering it punishable by heavy fines to purify methylated spirit, either by means of "filtrations or any other process which may free it or be intended to free it wholly or partially from any flavour or odour." The punishment also extends to those who have in their possession any such purified spirit. We think it by no means useless to point this out to our readers, as excise fines are heavy in amount, and their reduction is not at the discretion of magistrates.

The use of methylated solvents is almost universal in photography in cases where alcohol and its derivatives are employed—most popular varnishes and collodion, though there are well-known exceptions, being made by their aid. For the manufacture of varnish the methylated alcohol is scarcely inferior to the pure, its smell being the chief drawback. It is true that wood naphtha gives a varnish possessing distinct characteristics. Many french-polishers, for instance, prefer a polish made with its aid to a purely spirituous one; but we are not aware that any difference has been perceived, as varnishes, between varnishes made with pure and methylated spirits.

It is, however, to be remembered that wood naphtha is capable of dissolving pyroxyline, and hence under some conditions—peculiarity of pyroxyline employed and other causes—a methylated spirit varnish will mark, and sometimes dissolve, a film. The employment of less heat in the process and the addition of a few drops of water to the varnish (methylated spirits always being very strong) rarely fail to prevent any such catastrophe.

The use of methylated spirit in the manufacture of ether, loroform, &c., and its employment in collodion, forming an inte- sting portion of the consideration of the subject we will refer more lly to them, with their peculiarities and disadvantages and the ode of distinguishing them, in a future article.

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N our last number appeared an article by Mr. Reuben Mitchell, on *lkaline Development without Pyrogallic Acid for Dry Plates*, which, ithout a few words of explanation, is likely to cause some misunder- tanding amongst those who are not well acquainted with alkaline evelopment. Though we do not intend to dispute the fact that under ertain circumstances pyrogallic acid may be dispensed with in ringing out the image in its first stage, it is certain that in the ajority of instances ammonia alone is quite incapable of originating ny developing action. To speak, then, as Mr. Mitchell does of the matter, making no allusion to attendant circumstances which, in his wn case, may aid the result, is scarcely fair; for, though his own plates may be prepared by a process with which this style of development is compatible, very many of our readers are not so situated. As a general rule it will be found that the presence of some substance—such as pyrogallic acid, tannin, or gallic acid—in the film is necessary to produce the developing action, or, at least, that one of those substances should have been allowed to act upon the film, though it may have been subsequently removed by washing. But, even under these favourable circumstances, ammonia alone is not *always* capable of forming a visible image. Bath plates, and those prepared from emulsions containing excess of silver, frequently exhibit the power of development with ammonia alone; but the generality of emulsions are wholly unsuited to such treatment, especially when the proportion of alkali is so small as that recommended by Mr. Mitchell. We make these remarks in the hope of preventing disappointment.

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ON A BINOCULAR MICROSCOPE FOR HIGH POWERS.

[A communication to the British Association.]

Having of late bestowed much attention upon the subject of the production of binocular or stereoscopic photographs of microscopic objects, I purpose giving in this paper an outline of some of the methods I have employed with most convenience and success, concluding with an account of a system I adopted for use with high powers of the microscope.

Of the various forms of the binocular microscope none are more deservedly popular than that introduced by Mr. F. Wenham; but, when endeavouring to utilise this method for stereo-microphotography, I found it less satisfactory for use with low powers than a plan I shall presently describe, while for high powers it would not answer at all. It is one of the conditions of successful working in this direction that both sets of rays or pencils proceeding from the objective to the eyepieces shall receive precisely similar treatment throughout, but in the Wenham system one half of these rays are allowed to pass onward without interference, while the other half are received by a prism and subjected to two reflections previous to being received by the eyepiece.

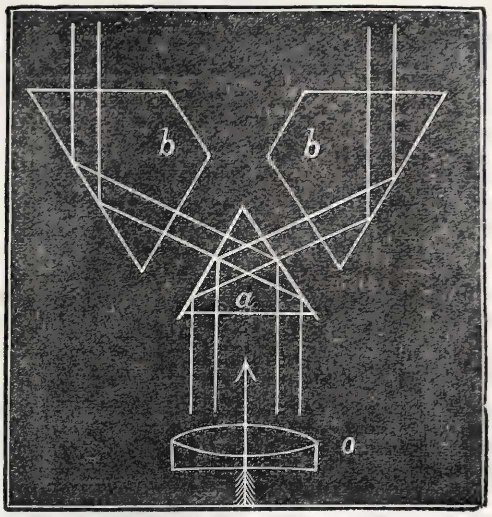
For stereoscopic photography with low powers I believe it will be found by the experimentalist that no method equals in efficiency one which I worked out a considerable time ago, and which was recently published.* It consists in employing an ordinary monocular microscope to the main stage of which is fitted a super-stage capable of being influenced by the mechanical adjustments of the instrument, and also of oscillating from right to left within a limited sphere, for which purpose the slide-holder is pivoted in such a manner that the axis of motion nearly coincides with the object to be photographed. A photograph having been obtained of the object when in one position, that object is tilted in the opposite direction and a second photograph obtained, these two forming a pair which, when combined in the stereoscope, show the object in all its natural solidity.

It will be readily understood that such a plan as that described, while perfect for use with the low powers of the microscope, is far from being so when objectives are employed the focus of which is so short that the covering glass of the object almost touches the anterior element of the power. Under such circumstances recourse must be had to the binocular microscope.

I have already given a reason why the Wenham prism does not answer. But there are other systems of a perfectly symmetrical character to which the same objection cannot apply, especially when utilised for purely visual purposes. The chief among those which I have tried are the following:—

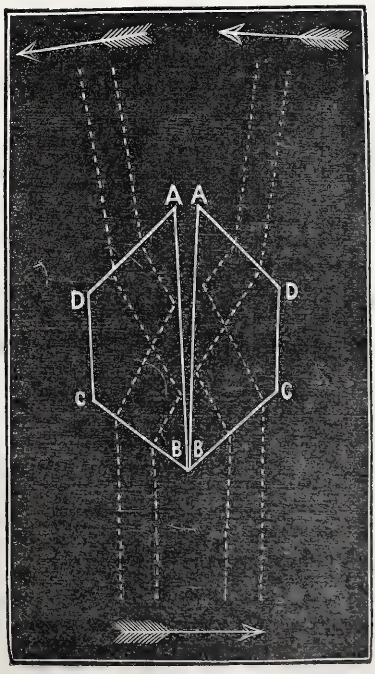
Nachet's Binocular.—In this arrangement the rays from the object-glass *o* are interrupted in their course by the prism *a* (*fig.* 1), which, presenting one surface at a right angle to the axis of the lens, permits the rays to enter and to pass onward until they reach that surface of the prism which is presented to them diagonally, when they undergo total reflection, passing onwards to the prisms *b*, of which there are a pair, as shown in the diagram. The form of these prisms is such as not to permit of any disturbance of the rays except at the surface, where they undergo total reflection and pass upwards towards the eyepieces. This should be one of the best forms of binocular, because there is reflection without refraction. Yet—possibly owing to errors of workmanship in the instrument—in several photographic experiments made by me with a Nachet binocular I failed to secure such definition in the negative as I imagined I had a right to expect. Dr. W. B. Carpenter, while admitting that the Nachet instrument comes near the theoretical standard of perfection, doubts the possibility of its affording a satisfactory view of the more difficult class of test objects; for, although the *general* course of the rays on entering and emerging from each prism may be perpendicular to its surfaces so that they suffer no refraction, many of them will, he says, be slightly oblique, therefore undergoing not only refraction but also some amount of chromatic dispension. It is perhaps unnecessary to remark that with the Nachet binocular only can the two pictures forming the stereoscopic pair be obtained simultaneously—at least upon one plate of glass.

FIG. 1.



Stephenson's Binocular.—It is doubtless owing to the consideration just adduced that the greatest amount of success, when using high powers, has not been achieved by means of the admirable binocular system introduced several years since by Mr. J. W. Stephenson. Its form is represented in the following diagram (*fig.* 2), in which the rays proceeding from the object-glass fall upon the surfaces C B of two truncated rectangular prisms, the hypothenuse planes of these prisms being placed together, but inclined to each other at an angle of about 4°. The whole of the light from the object-glass thus enters the prisms under circumstances which compel its refraction towards the surfaces A B, from which it is reflected, and, in its now divided form emerges from the surfaces A D, and proceeds onwards towards the eyepieces. In this system there are two refractors and one reflection, and these are still further increased by a second and erecting prism to be found in several of the higher-class instruments of this form. It has been intimated to me that a power of a $\frac{1}{25}$th of an inch has been used for visual purposes with a Stephenson binocular microscope; but when I endeavoured to use it with a far lower power in connection with photography good definition was not secured.

FIG. 2.



I now proceed to describe a method I have adopted, which, being based upon reflection from a metallic surface instead of that from the surface of a prism, is free from those sources of error spoken of by Dr. Carpenter, for here there is no prism employed.

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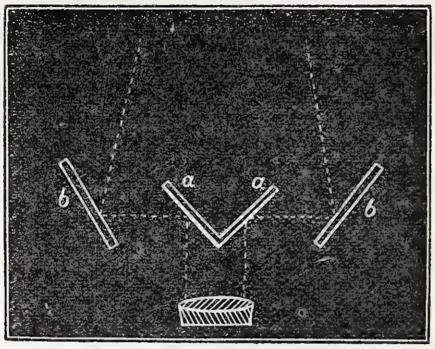
* In The British Journal of Photography, *ante* page 302.

The rays upon emergence from the object-glass are received by two small mirrors placed at an angle of 90° to each other, or at 45° to the axis of the objective. These divide the rays and reflect one half to the right and the other to the left. So far as concerns photography the conditions by which stereoscopic pictures are obtained are now complete. It is only necessary that the sensitive plates be placed in such a manner, and at such a distance from the mirrors in the line of the emerging rays, as to receive the magnified image formed upon the sensitive surface quite free from those unrecognised refractions which are the inevitable concomitant of the transmission of non-parallel rays through prisms. But I prefer to make each of the pencils undergo a second reflection, and this time, as before, from a *mirror* rather than from a prism, and for the same reason.

In the diagram the system now being described and advocated is clearly shown. *a a* (*fig.* 3) represent the mirrors, which are formed of plane surfaces of glass joined together at the proper angle, and then silvered on their faces by the chemical method now so well known, especially in connection with the preparation of mirrors for telescopes. The rays from the object-glass falling upon these are reflected in horizontal directions, but being intercepted by the mirrors *b b*, they are reflected upwards through tubes the existence of which we may imagine. The diagram only indicates the principle, not the detail.

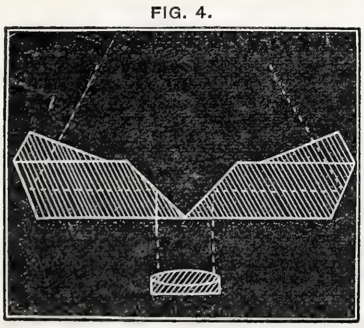
FIG. 3.



The loss of light by the two reflections is much less than would have been imagined, and the photographic image obtained by the use of high powers is better, as regards definition, than I have seen it when obtained by any other binocular system. When employed for visual purposes it is equally efficient, and, from the simplicity of its construction and the accuracy with which the mirrors may be adjusted, it is deserving of attention as an addition to our binocular microscopic resources.

I anticipate an objection that may be offered with respect to the tarnishing of the mirrors by stating that such liability to tarnish is less than is generally imagined, and that the occasional application of a soft wash-leather will keep the mirrors quite bright. Besides, they may be re-silvered at any time at an expenditure of a few minutes' time. But, some time ago, I had the reflections effected by internal impact upon glass, as in the diagram (*fig.* 4). The two reflecting surfaces are similar to those already described; but as the pencil would undergo refraction at the emerging surface I cemented a pair of acute-angle prisms to the reflecting prisms, as shown in the diagram, by which the surface was at a right angle with the emergent rays. This method, although tolerably good for visual purposes, even when high powers are employed (exceptional care being taken in the workmanship), is inferior for photographic use to the more simple reflectors I have described, and which can be employed with a sixteenth-of-an-inch power with good effect. In the diagram (*fig.* 4) I have indicated only the *general* principle by which the rays are reflected. To obtain an image quite free from colour great skill must be displayed in the selection of the glass as well as in the forms of the prisms, otherwise fringes of colour will inevitably make their appearance. Were it not for this it would be as well to construct the prism out of one piece of glass, when its shape would be very similar to that of the Wenham binocular. When making use of a pair of prisms properly achromatised I have quite failed to discover any colour when employing a one-twelfth of an inch objective.

FIG. 4.



If a microscope be constructed according to this principle it will be symmetrical in appearance, and, while being a perfect binocular instrument, may immediately be converted into a monocular microscope by withdrawing, in a "fore and aft" direction, the reflecting system, and deflecting to one side the double body (which must be pivoted at the junction of the axis of the two tubes) until one of them is made to stand in the line of axis of the object-glass.

J. Traill Taylor.

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ON THE THEORY OF THE ACTION OF CERTAIN ORGANIC SUBSTANCES IN INCREASING THE SENSITIVENESS OF SILVER HALOIDS.

In the early days of photo-chemistry it was observed that all the silver haloids gained in senstiveness by being in contact with a soluble silver salt, and that when the soluble silver salt was removed by careful washing a considerable diminution in sensitiveness followed. After a time it was noticed that certain organic substances placed in contact with the washed haloid appeared to take, to some extent, the place of the silver salt removed, and that the silver haloid was distinctly more sensitive when in contact, for example, with tannin than when isolated.

In explanation of the fact a theory was published by M. Poitevin that these organic substances acted in virtue of their affinity for the halogen; that in the case, for example, of tannin and silver iodide the iodide was more readily attacked by light in the presence of tannin, because the affinity of tannin for iodine came into play in aid of the action of light. Shortly after Dr. H. Vogel published the same theory.

It is a little remarkable that neither of the authors of this theory, or rather hypothesis, has at any time thought it necessary to support it by experiment or proof of any kind, but both have continued up to the present time to treat the theory as self-evident. In endeavouring to show that this explanation of the reaction cannot be received I shall have no argument on the other side to combat or experiments to discuss, as I can find none. I shall, therefore, state what I conceive to be the true explanation, and endeavour to support it adequately by proof.

When we examine all the substances known to be capable of increasing the sensitiveness of the silver haloids we notice that the one property which they possess in common is, *not* an affinity for the halogen, as the Poitevin-Vogel theory would lead us to expect, but that they *are all reducing agents.* The natural view, therefore, of their action on a silver haloid is, not that they abstract the halogen from it, but that their affinity for oxygen comes into aid of the affinity of the halogen for hydrogen, and that under the influence of light an atom of water is decomposed; that in the case of silver iodide and tannin, for example, the tannin is oxidised, the iodine is converted into hydriodic acid, and the silver salt is more or less completely reduced, probably to subiodide. According to this view, when silver iodide is exposed to light in presence of an organic body capable of accelerating the action of light, there should be traces of free acid formed; whereas, according to the Poitevin-Vogel theory, the result of the action should be the formation of an iodo-substitution compound.

1. Silver iodide was precipitated in the presence of a slight excess of potassium iodide, and thoroughly washed. A small quantity of pyrogallol was added, and the mixture was exposed to sunlight for fifteen minutes in contact with water. The liquid, at first neutral, at the end of fifteen minutes showed a distinctly acid reaction, increasing with continued exposure.

[Pyrogallol was used in preference to tannin (gallo-tannic acid) because the former is perfectly neutral to test paper, and cannot confuse the reaction, as would be the case with tannin, which of itself reddens blue litmus paper.]

Again: if the Poitevin-Vogel theory were correct it would afford a criterion as to what substances should and what should not exalt the sensitiveness of the silver haloids. Substances having an affinity for iodine should increase the sensitiveness, and substances not possessing such affinity should have no such action. This is not the fact. There are substances which exalt an affinity for iodine that do not exalt the sensitiveness of silver iodide, and conversely. For example:—

2. Silver iodide was exposed to light for a month under a solution of potassium carbonate in a test tube, with another test tube, for comparison, containing silver iodide under water only. The alkali did not in the least increase the tendency of the iodide to darken.

3. Starch, which has a well-known affinity for iodine, does not appear to increase the sensitiveness of silver iodide by contact with it.

These experimental results appear to be incompatible with the Poitevin-Vogel theory.

The view which I have here offered is, moreover, very strongly supported by the phenomena of alkaline development. When a sensitive surface has been exposed to light the image may be developed by pyrogallol—a neutral organic substance. This development is greatly stimulated by the presence of an alkali—a fact which the Poitevin-Vogel theory leaves unexplained. But, according to the view here proposed, viz., that the result of the action of the organic body is not a substitution product, but a halogen acid (*e.g.*, HI, &c.), it is natural that the presence of an alkali should increase the tendency to form an acid for which it has a strong affinity.

Also, this new explanation is in harmony with received views of the action of the halogens in analogous cases, and particularly with that of the action of chlorine in bleaching organic substances. The modern view of the action is, not that the chlorine attacks the organic body with formation of a substitution compound, but that by the co-operating affinity of the organic substance for oxygen, and that of the chlorine for hydrogen, an atom of water is decomposed, with formation of hydrochloric acid and peroxide of hydrogen, which latter substance attacks the oxidisable organic body. It will be observed that the reaction is exactly the same in both cases—the bleaching and the photo-chemical. In fact, the parallelism is in all respects as complete as it can possibly be, and the analogy lends a strong support to the view I have here expressed.

I conclude, therefore, that such organic bodies as increase the sensitiveness of the silver haloids to light do so, not by forming substitution compounds with the halogen, but by promoting, in virtue of their affinity for oxygen, the decomposition of water by the halogen.

There is, probably, another affinity which plays some part in the tendency to form the halogen acid, and that is the tendency shown by the silver haloid to form combinations with the corresponding halogen acids, *e.g.*, hydro-argentic iodide AgIHI, &c., in the absence of an alkali. M. CAREY LEA.

—*American Journal of Science and Arts.*

THE ART OF PAINTING UPON THE PHOTOGRAPHIC IMAGE.

No. I.

THE writer of this and following papers on the above subject hopes to give a tolerably exhaustive guide to beginners. They are intended to help them at the commencement, and to save them time, trouble, and much discouragement in finding out things for themselves. In the course of the series the writer thinks it possible that those possessing experience may find here and there an acceptable hint, especially as regards painting on autotypes, about which there seems to be still great misconception; indeed, to the writer it seems odd that at this time of day any valuable or highly-finished work should ever be put by artists on anything else. Autotypes are easier to paint upon than albumenised prints, and, to any one not very clever at drawing, far preferable to a silver print on plain paper, besides, what should surely be an object with everyone who wishes to deal fairly by their clients, their permanence.

Firstly, then, I will treat of monochrome work, or work in one colour or tint. For this the student will require a tube of moist water-colour, ivory black, a half-cake of burnt carmine, a half-cake of burnt sienna, a bottle of Chinese white, a bottle of prepared gum water, and, for autotype work, a little powdered pumice; also a sharp knife, a piece of ink-eraser, and a piece of vulcanised india-rubber.

I will describe the method for autotype work, because it is the same as on silver, except that, in the latter, you cannot have the inestimable advantage of being able to scrape to any extent, which is generally the first thing to be done to an autotype, and it is so hard that you may scrape it with a knife, or take out a light where required with an ink-eraser, and the ground will be as smooth and as workable as ever.

Take, then, an ordinary autotype print, and, holding the piece of vulcanised india-rubber firmly, carry it across the picture all over from left to right and from top to bottom. This, it will be found, will generally remove all traces of grease; but if that fail a strong solution of ammonia will invariably answer the purpose. If the latter be used, wait until the picture is *quite dry*, and then examine it for any black spots or shadows that require lightening. These may then be removed with the knife or ink-eraser, or toned down, as the case may be. If the face be very dark all over rub it briskly with powdered pumice, blowing it off now and then to see how you are getting on. The high lights on forehead, nose, &c., may then be improved and lightened, if necessary, with the ink-eraser.

Next consider if the hair or face can be improved by a wash here or there. If the hair be white or grey it will probably be improved by a light wash all over, using gum with it, and then, when dry, a space representing the highest light damped and quickly removed with a sweep of a clean, dry cloth. Also, in the case of a very white face, arising from a dense negative, a wash all over will save much time and trouble. Soft, indefinite lights may be got by taking them out with a dry brush whilst the wash is wet; but sharp ones are got by the former method. The drapery should now be attended to by darkening the shadows with colour and plenty of gum. Now see to the eyes. In most cases the spark of light in the eye will require to be lessened, preserving, however, the form of it; and the black spot or pupil will generally bear enlarging, but be careful to keep the shape the same, and also its relative position in regard to the outline of the iris or coloured part of the eye. It is very essential to give the eye a lifelike, thinking expression; and if this be done it will hide a multitude of sins in other parts of the picture. JOSEPH WAKE.

A FURTHER ATTEMPT TO SYSTEMATISE EMULSIONS. —ANSWERS TO OBJECTIONS.

No. II.

I WISH, if the Editors will permit me, to answer some of the objections they have made to my theory in a late number, and also to put forward some more suggestions relative to this, to me, most interesting topic.

Referring to the third paragraph of the editorial article at page 386, I will first make a few remarks on the statements there made in connection with the bromide process with the bath.

If we are to accept the statement of the case by the Editors, as I understand them, I would suppose that, in the case of a film prepared in a weak bath, the bromide, though fine, cannot be produced, for some reason, in sufficient quantity to give on development a dense image. To me it seems very unlikely that, if all the soluble bromide were converted into silver bromide in fine division, such a film would give a thin image. With regard to the film prepared in a strong bath I should suppose that the effect of a tendency to coarseness, which must be very slight, is counterbalanced in the development by the richness of the film in silver bromide.

Not having sensitised a bromide film in a weak bath I cannot add any testimony of my own as to the peculiarities of such a film; but, from what I have read, it would appear that a weak bath with the bromide process causes the same ills which it does with the ordinary wet process; and that coarseness, not fineness, is the result of using a weak bath. If so, we can understand how it is that the image is poor and thin. I append a paragraph from the late Mr. Thomas Sutton's pamphlet, *A New Wet Collodion Process*:—

> "The reader is cautioned against using a bath of less strength than eighty grains—first, because of the time wasted in coating a plate with a weaker bath; and, secondly, because of the risk there is of getting cloudy films, and also of the bromide of silver bursting out. These clouds form insensitive patches, because they are more opaque than the rest of the film, and light cannot so readily penetrate beneath the surface and act upon the sensitive material in the interior and quite through to the back of the film, as it ought to do in this process in the high lights."

Besides this fact I have already pointed out (I presume it is one) we read that Mr. Sutton found that the "opaque" patches were *less* sensitive than the rest of the film, and he adds that "light cannot so readily penetrate beneath the surface and act upon the sensitive material in the interior." This might affect the density, but hardly, I think, the sensitiveness. When, however, we consider that the bromide in such a case is formed under unusual conditions—conditions somewhat akin to those where the bromide is formed in the absence of organic matter—we can readily understand that, after all, insensitiveness might be the characteristic of the "opaque patches."

I hope I have succeeded in showing that, after all, a fine, "transparent" bromide may not be produced by the weak bath, but that, probably, by using a bath of a slightly greater strength and by allowing extra time a fine film may be produced.

While I do not intend to deny the proposition that, as the Editors state, "high-temperature" pyroxyline, as a rule, will produce more "creamy" films than that made at a low temperature, because I do not feel justified in doing so, I may still remark that the ordinary pyroxyline used for the wet process will produce, with excess of silver, a very opaque film. I have been using such a pyroxyline in my experiments. There is, however, no doubt that a "high-temperature" pyroxyline might produce an opaque film, due to coarseness (though perhaps some other cause than coarseness tends as well to opacity), because a certain number of grains of it would not produce so gelatinous a solution as would the same number of a lower-temperature pyroxyline.

I do not think that, as the Editors go on to say, the "creamy" emulsions are "generally transparent enough" while wet. Whilst in the bottle they are very opaque—an effect due either to comparative coarseness or to some other physical peculiarity; but it is also quite true that the films prepared with them become more opaque on drying. I do not believe this to be due to any great extent to the "dusty pyroxyline," but rather to the bromide itself. While the film is still wet the particles of bromide are in optical contact, just as is the case with a piece of wet or waxed paper; the consequence is that the light is not reflected from the surface of the particles to so great an extent as is the case with a dry film.

Against this it will be urged that the finer or, to use a safer expression, the more transparent films do not become more opaque on drying, but rather the reverse. I would explain this by one of the following hypotheses:—Either that, in the case of the transparent films, these, by reason of the contractile nature of the pyroxyline, which is hardly retarded by the fine particles of bromide, on drying bring the latter into closer contact than they previously were, so producing optical contact. Against this it may be said that I have shown the particles in *both the wet and the dry* transparent films to be in "optical contact." How, then, under the hypothesis do I account for the dry films being the more transparent? Well, the hypothesis *is* shaky there. I will, therefore, put forward the second.

We will suppose that by a re-arrangement of the atoms the molecules of bromide may be formed as hollow spheres. These would naturally reflect light from their outer surfaces, just as the foam in the waterfall does. On drying, in the case of the transparent film, the "hollow spheres" collapse through pressure, while in the case of the opaque film they become more isolated, owing to the evaporation of the moisture, which latter causes a diminution of reflection of light. In the opaque film the prolonged action of the silver nitrate on the pyroxyline makes it less contractile, and the "hollow spheres" may be more numerous.

I may here state that my opinion is that, as the film can exercise a restraining influence over the bromide in fine division, so can the bromide in fine division stop the pores of the film, the combination of the two resisting the action of the developer, the result being what we are in the habit of calling "an insensitive film."

To return to the matter in hand: I think that the evidence of our eyes will hardly allow us to suppose that the change produced in the pyroxyline by free silver nitrate is, *per se*, the cause of the "dusty," dull appearance. When the bromide has been dissolved out by the fixing solution the dry film does not usually present a dull appearance. The pyroxyline so acted on may cause the bromide to assume a peculiar appearance, but it is not the pyroxyline which appears dull to our sense of sight.

With regard to zinc bromide giving a more opaque film than does ammonium bromide, as mentioned by the Editors, it is well to note that this is not the case under all circumstances, but that the effect must be due to other attendant circumstances; for I have produced extremely fine, rich-coloured films with zinc bromide—finer, or, at least, more transparent, than with ammonium bromide, but this was when using gelatine, not pyroxyline.

I feel rather inclined to protest against my theory being expected to "hold good" under all circumstances. What is "sauce for the goose" is not always "sauce for the gander." It is possible that when coarseness is produced under certain circumstances other conditions are not complied with, the result militating against and counterbalancing any advantage to be gained by the comparative coarseness.

If my "hollow-sphere" hypothesis should be considered unwarranted by any known facts in chemistry or physics, it should still be remembered that we have not only to account for a "dusty" film becoming more opaque on drying—a fact seemingly not difficult to explain without going far out of our way—but we have also to account for some kinds of films (notably those prepared with the bath and with free bromide emulsions) becoming more transparent on drying. Will some one propound a theory more in accordance with known facts?

It is possible that the most opaque film may not always indicate the coarsest. I will begin by proposing that the opacity is partly brought about by other causes than a state of coarser division, and that it is the effect of this other cause which produces extreme sensitiveness. To apply the "hollow-sphere" hypothesis: if we imagine that the hollow spheres, when present in large quantity, deflect the rays received on their surfaces on others more capable of being impressed by light, we can understand how these latter acquire an increased portion of light, and, therefore, of chemical action. The result would be increased sensitiveness, but also considerably impaired density of image. This is what we find to be the case in actual practice.

After all, we know the anecdote of James I. and the fish-bowl. May we not be imitating unwillingly that pedantic monarch? I say "we," because I believe that most thinkers on the subject have held the opinion that one plate is more rapid than another in the ratio of its amenability to the action of light. This is, of course, true in certain cases, such as that where a neutral emulsion is more sensitive than one with free bromide. But let us take the case of emulsions under nominally the same conditions, but which differ in "sensitiveness," and I think that the more correct conclusion to come to is—not that the one emulsion withstands the action of light longer than the other, but that the one resists the action of the developer for a longer time than the other, as I have already shown in a previous article.

There remains the question whether the colour of an emulsion increases its sensitiveness for any particular coloured rays. This does not seem unlikely, and it may explain some conflicting statements as to the alleged superior sensitiveness of certain films. It would, then, appear that a great deal would depend upon the nature of the subject photographed.

I think that I have now exhausted my topic, and also my readers, for the present. Will anyone decide to run a tilt at it?

Herbert B. Berkeley.

LIGHT IN THE DARK ROOM.

Considering that my object in this article is a plea for correctness of expression—the calling of things by their proper names—the title, which is really a misnomer, may be considered a mistake; but "dark room" has so long been synonymous with a room into which only non-actinic light is admitted that, perhaps, it may be allowed to pass.

Photographers, especially those addicted to emulsion work, owe such a deep debt of gratitude to Mr. Henry Cooper that one is unwilling to even seem to cavil at any form of expression he may choose to employ; but the proper lighting of the dark room is a matter of such importance that photographers, generally, would find their comfort increased, and their failures reduced by a more intimate acquaintance with, and *correct* knowledge of, the principles involved in the production of a light suitable for their work. I say, emphatically, "correct" knowledge, as I am convinced that the absence of that has long caused many otherwise excellent manipulators to work under the serious disadvantages of a light too limited in quantity and unsuitable in quality.

Mr. Cooper (at page 390 of the number last week) say he finds great comfort from working with a green blind over the orange glass in his dark room, as it produces a neutral-tinted light most agreeable to work in. This is all right, but a few lines further on he adds that he discovered, some seven years ago, that a similar arrangement gave a non-actinic white light—a statement which, in the ordinary acceptation of the term, is certainly hardly correct. The fact, however, remains that a green screen, which ought to lessen and darken the rays passing through an orange glass, really seems to increase their illuminating power, and materially whitens them, without in any degree increasing their actinism. Why this should be so is, perhaps, worth a little consideration, as is undoubtedly everything connected with light.

Premising, then, that ordinary white light is made up of the three rays—red, green, and violet—and that each has its own part to play in the economy of nature, our first inquiry should be as to their influence on the sensitive photographic film. Whatever the change may actually be—and that is a matter yet very little understood—it is, as if by one consent, attributed to what is called "actinism;" but what actinism is, or in which of the rays it exists, is not so easily determined, the difficulty mainly arising from the fact that each ray possesses an actinism of its own called into action by the presentation of suitable substances. So long as simple silver iodide was the sensitive photographic medium this subtle actinism was supposed to be confined to the violet or more refrangible end of the spectrum, and that the red or green, being non-actinic, might be indiscriminately used, while, in practice, a yellow or orange—a compound of both—was universally adopted. The introduction of silver bromide, especially in its more sensitive forms, rendered a reconsideration of the question necessary; and in some cases, without being aware of it, the discovery was made that it was affected by the actinism of the green, and this colour was more and more eliminated till a dark orange or even a ruby was reached. Of course such colours are not so comfortable to work in; but those who will have a highly-sensitive bromised surface must so far pay the penalty. But the penalty is, in most cases, made much heavier than it ought to be, in consequence of the difficulty of obtaining glass of anything like pure tints, the glass stainer's object being the production of beautiful colours altogether irrespective of their purity. Were it possible (and I do not see why it should not be so) to make glass perfectly pure—that is, really monochromatic or bichromatic—the operator might flood his room with such a quantity of suitable light as would illuminate every corner without affecting the most sensitive plate.

For the practice of photography with the materials in use at the present time a full red light is theoretically the safest and best; but a monochromatic light possesses little illuminating power, and, therefore, for comfort the red should have combined with it as much of the green as the sensitive surface will bear, every ray of green, even although it should be as dark as, or darker than, the red, serving to greatly increase the illumination. We are fond of saying that "two blacks never make a white," but this is only relatively true, as certainly in this case two darks make a light. Why this should be so is not difficult to understand. The wave lengths of the red being different from those of the green, they can vibrate side by side in the same space, and thereby become doubled in quantity without increase in bulk, if it be permissible thus to speak of light as if it were matter.

Now that the spectroscope is becoming popularised we may hope that more attention will be given to colour generally, and that, if glass stainers cannot give us pure colours, means may be found by which we can make them for ourselves. Is it too utopian an idea to suppose that by and by we may have a simple arrangement of three gasometers connected with one burner, and each containing a gas, the combustion of which would give a separate ray of the spectrum? In this way, by the simple turning of a tap, we would secure any single ray or any combination of all three. JOHN NICOL, Ph.D.

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GRANULATIONS OBTAINED ON THE SURFACE OF BICHROMATED GELATINE.

SINCE the announcement, in the *Bulletin de la Société Française de Photographie*, of the description of the heliographic engraving process of M. Placet, M. Rousselon has, in the same organ, protested against the assertions made by M. Placet relative to the discovery of the means whereby a chemical granulation is obtained. It is the opinion of M. Rousselon that he himself should have the incontestable right of the discovery of the chemical means for obtaining granulations on copper plates prepared by photographic agency.

The double claim for priority has, in the present case, been argued to a sufficient extent; and it seems to me that the priority should not go to either one or the other of these two claimants, who have not, in reality, discovered a new means of producing a chemical granulation on the surface of bichromated gelatine, both using a known property, and applying it to the art of helio-engraving.

With regard to priority: there are M. Poitevin and others who have by light obtained impressions on bichromated gelatine. It is not necessary that the bichromated gelatine plate be immersed in water after exposing it to light. Respecting the granulation: the darker the shadows are the more grain they contain, and the entire whites are free from any grain. The roughness, more or less marked on the gelatine, requires that a counter-mould should be taken. For this excellent discovery we are indebted to Mr. W. B. Woodbury, who introduced it as a means of producing copper plates. But M. Poitevin already had the idea of moulding a plate from the hard gelatine and of making counter-moulds, and then by means of the galvanic battery producing a new mould in relief.

I do not assume that new chemical means have been discovered for producing more or less the grain for helio-engraving, but that it is a modification of those introduced and still used in the art of photographic engraving. It resolves itself into this:—Does Placet or Rousselon obtain the best results from this principle? We know that a graduated granulation of a layer of bichromated gelatine is obtained if, after being exposed to light, it is plunged into water; after being taken out the image on the surface will be found to have a grain more or less marked.

When a layer of gelatine has been in a greater or less degree submitted to the action of the light it is rendered more or less insoluble. This, then, is the principle of the bichromated gelatine and photographic processes. When the action of the light has produced the desired effect (in the case of the phototype) the gelatine is immersed in water. What happens then? The portions of this surface that have been more or less exposed are, in the same ratio, impregnated by this water. The penetration is very difficult in those parts which have been affected by the light. The gelatine constituting this layer will become swollen, and such swelling will be uniform in the entire thickness of those parts which are to act as pure whites. The other parts will swell in proportion, and if there exist a part which has become totally insoluble it will resist the penetration of the liquid. A kind of grain will be formed in proportion to the intensity of the luminous action. It is true that if the gelatine has been exposed to light for too great a time the image on the entire surface will become lost, and immersion in water will have no action whatever on it.

It has been suggested by M. Albert, of Munich, that the back of the gelatine should also be exposed to light in order to prevent any further action on that part. The back, in this case, becomes insoluble, and the layer composing the face partly so, according to the action that the light has exercised. M. Albert also had the idea of pouring some gelatine on a glass, and, having rendered it insoluble, making up the required thickness with bichromated gelatine. After having coated the plate with albumen and exposed it the gelatine will adhere firmly to the albumen, after it is rendered insoluble and incapable of swelling by penetration of the liquid. This insolation previous to printing from the negative is preferable to that after the image has already been formed on the gelatine. The grain of the image is graduated in the half-tints according to the solidity of the film.

The phenomena here described form the basis on which have been made the various claims for priority in the discovery of a chemical means of obtaining granulations.

I have not been able to examine the different processes used for obtaining artificial granulations, but will say a word or two on the means used by M. Despaquis. It is difficult to make an artificial grain resembling that obtained by chemical means. In using a fine powder it is necessary that it should be evenly and regularly distributed.

I have seen M. Rousselon's operations, but the material in question is not so much the grain as a substance capable of being contracted, more especially by merely dipping in water. When tannin, pyrogallic acid, protosulphate of iron, &c., are used the effect is purely chemical.

When once the grain is obtained it is a comparatively easy matter to make a counter-mould, from which a metallic surface resembling the original can be obtained.

When the process of copperplate engraving has reached perfection it will be interesting to look back over the difficulties that have occurred. LEON VIDAL.

—*Le Moniteur de la Photographie.*

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ON THE THEORY AND PRACTICE OF LEAD INTENSIFICATION.—A REPLY TO PROFESSOR WARTHA.*

A PAPER by Professor Wartha, on the lead intensification process, appeared last month in the *Photographische Correspondenz*, in which he sets down as incorrect the equation which I gave as representing the analysis of the action of ferricyanide of lead upon silver, and also combats my views as to the extent to which lead intensification is useful.

The action of a quantity of ferricyanide of potassium and nitrate of lead upon metallic silver I expressed by the equations—

$$\text{I.—}2\,K_6\,Fe_2\,Cy_{12} + 4\,Ag = 3\,K_4\,Fe\,Cy_6 + Ag_4\,Fe\,Cy_6.$$

$$\text{II.—}3\,K_4\,Fe\,Cy_6 + 6\,Pb\,(NO_3)_2 = 3\,Pb_2\,Fe\,Cy_6 + 12\,K\,NO_3.$$

The first part of the process I confirmed by analytical experiments, and I inferred the second.

Professor Wartha admits the accuracy of equation I., according to which ferrocyanide of silver is formed; he holds, however, that ferricyanide of lead does not behave like ferricyanide of potassium, but that it forms with silver *ferri*cyanide of silver and ferrocyanide of lead, while I assume that *ferro*cyanide of silver and ferrocyanide of lead are formed. Professor Wartha infers the presence of ferricyanide of silver—firstly, from the orange colour produced by treat-

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* See page 330 of THE BRITISH JOURNAL OF PHOTOGRAPHY, July 13th, 1877. On page 331, Professor Wartha's equations, instead of reading—

$$\text{I.}\quad 4\,FeII\,Cy_4\,K_6 + 6\,Ag = 6\,(Fe\,Cy_2\,K_4) + Fe\,IICy_4\,Ag_6.$$

$$\text{II.}\quad 6\,(Fe\,Cy_2\,K_4) + 12\,Pb\,(NO_3)_2 = 6\,(Fe\,Cy_2\,Pb_2) + 24\,K\,NO_3\,;$$

should read:

$$\text{I.}\quad 4\,FeII\,Pr_4\,K_6 + 6\,Ag = 6\,(Fe\,Pr_2\,K_4) + FeII\,Pr_4\,Ag_6.$$

$$\text{II.}\quad 6\,(Fe\,Pr_2\,K_4) + 12\,Pb\,(NO_3)_2 = 6\,(Fe\,Pr_2\,Pb_2) + 24\,K\,NO_3,$$

or, even better—

$$\text{I.}\quad 4\,(K_6\,Fe_2\,Cy_{12}) + 6\,Ag = 6\,(K_4\,Fe\,Cy_6) + Ag_6\,Fe_2\,Cy\,12,$$

$$\text{II.}\quad 6\,(K_4\,Fe\,Cy_6) + 12\,Pb\,(NO_3)_2 = 6\,(Pb_2\,Fe\,Cy_6) + 24\,K\,NO_3.$$

ing silver with ferricyanide of lead, and which is to be remarked in all negatives intensified with lead; and, secondly, from the conversion of the yellow colour to white by reducing agents, such as soda and zinc.

To conclude from these reactions that the substance was ferricyanide of lead is, however, precipitate, since they only indicate a ferricyanide compound, and in this respect Professor Wartha's equations—

I.—$4\,(K_6\ Fe_2\ Cy_{12}) + 6\,Ag = 6\,(K_4\ Fe\ Cy_6) + Ag_6\ Fe_2\ Cy_{12}$,
II.—$6\,(K_4\ Fe\ Cy_6) + 12\,Pb\,(NO_3)_2 = 6\,(Pb_2\ Fe\ Cy_6) + 24\,K\,NO_3$,

seem questionable even if the increase of weight Professor Wartha got by analysis coincided with that got by his theoretical computation, and therefore seemed to support his equation. Besides, even if Professor Wartha's assumption were correct, the proof was but feeble; so I set on foot more exhaustive experiments as to the action of ferricyanide of lead upon silver, the final results of which confirmed my former view.

If a mixture of ferricyanide of potassium and nitrate of lead[*] be allowed to act upon finely-pulverised silver (I use silver reduced from nitrate of silver by an acid solution of protoxide of iron), in a short time a bulky orange-yellow deposit will be formed. In order to facilitate the entrance of the fluid into the spongy silver I placed the mixture under an air-pump, and by removing the air pressed the solution into the silver; then I left it in the dark for three days, stirring it frequently, after which I collected the deposit upon a double filter. The latter was washed with cold water until the washing water ceased to run off yellow and no longer gave a ferricyanic reaction.

This washing, however, proceeds with extreme difficulty, as Professor Wartha must have found, though he does not mention it. A mixture of one gramme of the deposit requires to be rinsed about a hundred times with the washing water, and one of 1·6 gramme must be washed about two hundred times, which, taking the capacity of the filter at 12 c.c. makes some two and a-half litres of washing water. In this way the colour of the deposit becomes lighter and lighter, until at last it is but a pale yellow, or, if one work slowly, somewhat greenish, owing to the decomposition of the ferrocyanide of silver. The yellowish washing-water contained ferricyanide of lead, of which I convinced myself by evaporating and analysing.

It is remarkable that the metallic silver in dilute solutions of ferricyanide of potassium and nitrate of lead are less orange-yellow-coloured, and are more easily washed than when the solution is concentrated. In the same way negatives intensified with lead are always white if they are washed long enough, especially under running water.

When I had at last sufficiently washed the above-mentioned deposit I dried it at a temperature of 30° to 40° C., and then left it for three days in a vacuum over sulphuric acid. Ferrocyanide of lead might easily have borne to be dried at a temperature of 100° C.,[†] but I feared to decompose the silver compound.[‡] I had put 0·2830 grammes of silver in the solution of ferricyanide of potassium and lead; when the reaction had ceased, and the washing and drying were ended, the deposit weighed 1·6398 grammes, which was very near 1·6519 grammes, the computed quantity in the mixture according to my equation, but very far removed from Professor Wartha's computed analytical equation—2·1111 grammes. The somewhat too low amount found is explainable by the incomplete conversion of the silver in the ferrocyanide and the partial decomposition of the deposit by air and light.

The facts that the colour of the deposit becomes white with washing, that ferricyanide of lead can be washed out, and that the weight found almost corresponds with that of my equation, makes the correctness of the latter very probable; while, in the same degree, Professor Wartha's equation (according to which orange-yellow ferricyanide of silver is formed, which cannot be removed by washing) loses in probability. The assumption is pretty much that the products of the reaction consist of ferrocyanide of silver and ferrocyanide of lead, which are obstinately mixed up with the difficult-of-solution ferricyanide of lead. Gay-Lussac already found that, from solutions of iron-cyanogen and a metal, ferrocyanide of lead could only be washed with difficulty. For this, however, many analogies might be found—as, for example, sulphate of baryta.

Nevertheless, I wished to determine definitely by quantitative analysis the course of the reaction of ferricyanide of lead upon silver; but, as in this department of chemistry there are not the requisite formulæ, I had first to seek for a method of analysing, and then to demonstrate its correctness. A collective determination of the separate contents would have been of little use, as what I wished to determine was how much ferrocyanide was combined with the silver, and then how much was separated as a silver compound.

—*Photographische Correspondenz.* J. M. Eder, M.D.

(To be concluded in our next.)

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IMPORTANT SOLAR DISCOVERY.

The interest displayed in the discovery by Dr. H. Draper of oxygen in the sun—particulars of which were published in our last number—has been very great, and physicists in this country have already been bestowing attention upon this discovery. The following article, understood to be written by a gentleman whose name is well known in the photographic world as that of an intelligent investigator into solar physics, has been contributed to the *Daily News,* and will form a fitting supplement to what we published last week:—

Eighteen years have passed since the world of science was startled by the announcement that iron and other metals had been discovered in the sun. A change has come over the educated world since then. It is strange to think how little attention was generally given at that time to the greatest success which had been achieved by the human intellect since Newton discovered the law of gravitation. It was the world of science only which was startled by the news of Kirchhoff's noble discovery. Several years passed before it became generally known that men of science had been able to analyse the sun's substance, and many more before it became generally understood how the work was done. We venture to predict that not as many weeks will now pass before the great discovery we have now to describe will be widely known and generally appreciated.

Everything in the sun which can give us information of its own nature and condition is of necessity vaporous. It may well be that very nearly the whole mass of the sun is vaporous, but certainly the part we can analyse with the spectroscope is so. And, speaking generally, it may be said that every substance in the sun which has hitherto been successfully dealt with by the spectroscopic method is either always or usually cooler than the general mass of the sun. A vaporous envelope, cooler than the glowing body which it surrounds, cuts off a portion of the light from that body—a portion only, but much depends on the nature of that portion. If the sun's light, for instance, were enfeebled, ray by ray, through the absorptive action of a relatively cool envelope, we could know nothing about the nature of that envelope; there might be a deep envelope of some very transparent vapour or a shallow envelope of a denser vapour. But if, as is actually the case, the cooler envelope abstracts a ray here and another there, a band of rays in one place and a group of rays in another, we can tell what the vapour is; for every vapour has its own way of selecting rays. Thus was the presence of sodium determined, because the pair of orange rays which sodium always selects were found wanting from the solar spectrum. Iron selects 450 rays (at least) of all tints of the rainbow, and as all these are absent from the sun's light the astronomer knows that the relatively cool vapour of iron has been at work round the sun, abstracting its own set of vapours. So with copper and zinc, aluminium, magnesium, barium, and several other elements, all metallic. So also with hydrogen. These elements, fourteen in all, abstract from the glowing inner Sun portions of the light coming from him. Tens of thousands of rays, or, more correctly, tens of thousands of tints, are abstracted from the rainbow series of colours which together make up white light. One might well believe that no light would remain; but in truth the tints of the spectrum are millions in number, or practically infinite.

Seeing, then, that an element does not usually announce its presence in the solar atmosphere unless it is relatively cool—though absolutely it must be intensely hot, for the vapours of iron and copper cannot be zephyrs—astronomers were not altogether surprised that they could obtain no evidence of the presence of many elements in the sun. Gold and silver, lead, mercury, and platinum might not exist in sufficient quantities in the cooler outside strata of the sun's atmosphere to produce their characteristic absorptive effects by abstracting their appropriate rays; but, whatever might be thought about these elements, it was regarded as strange that an element like oxygen—forming, acccording to some, one-half, and, according to the lowest estimate at least one-third, of the entire mass of our earth—should show no signs of its presence in the sun, which, according to all the most probable conceptions of the origin and nature of the solar system, is constructed of the same materials as the earth, not very differently proportioned. We must remember that in the sun the gases—hydrogen, oxygen, nitrogen, &c.—are not precisely like these gases in our laboratories. We know chiefly of hydrogen as a combustible gas, of oxygen as a supporter of combustion, and of nitrogen as a gas of negative rather than positive properties. But in the sun all these gases must simply present themselves as vapours at exceedingly high temperatures. Hydrogen does not burn, and oxygen does not support combustion; both glow with the intensity of the heat to which they are exposed. Hydrogen, we had known, glows with bright light even where it indicates its presence by dark lines, and even though those dark lines really represent its light; for it has been only necessary to examine the light of the hydrogen alone, getting rid of the bright background of the spectrum, to see the seemingly dark lines transformed into very bright lines. And sometimes (it was to such exceptional cases we referred in using above the words "speaking generally") the solar hydrogen rises to so great an intensity of light and heat that the hydrogen lines are seen bright instead of dark on the background of the spectrum itself. Now if a third, or anything like a third, of the sun's substance consisted of oxygen, as is the case with our earth, we might expect to have the same spectroscopic evidence of the presence of this important constituent of the sun's substance. Yet none of the dark lines, either of oxygen or nitrogen, or of carbon, sulphur, and other elements which we might well expect to find in the sun, have ever been seen either in the spectrum of the sun as a whole or in the spectrum of any portion of the sun's surface—whether spot, facula, mottling, rice-grains, or willow leaves.

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[*] Four parts of nitrate of lead and six of ferricyanide in one hundred parts of water are the proportions previously recommended for the intensifying fluid.

[†] Compare with Wyronboff's newest experiments with ferrocyanides in the *Annales de Chem. et de Phys.* (5), VIII., 444.

[‡] Professor Wartha does not give the temperature at which he dried the deposit, though it appears to affect the ease or difficulty of decomposition of the ferro- and ferricyanide of silver.

The idea of searching specially for the bright lines instead of the dark lines of oxygen does not seem to have occurred to any one. It was known that hydrogen sometimes shows bright lines, and that in some of the stars hydrogen is only known at all by its bright lines. It was known also that there is an element in the solar atmosphere which gives a very well-marked bright line when shining alone, but does not give a dark line under usual conditions. One might have thought the idea would naturally have occurred that oxygen may show bright lines, since it certainly shows no dark ones. The present writer, referring to the absence of any signs of oxygen in the sun's spectrum, remarked in 1870 that "the element may be in a condition enabling it to radiate as much light as it absorbs, or else very little more or very little less, so that it either wholly obliterates all signs of its existence, whether in the form of dark lines or bright lines, or else gives lines so little brighter or darker than the surrounding parts of the spectrum that we can detect no trace of their existence." It now appears that oxygen does give lines a little brighter than the surrounding parts of the spectrum, and that their existence can be detected; for Dr. Henry Draper, of New York—one of the three eminent American sons of the great English physicist, Dr. W. Draper—in a photographic record of a part of the solar spectrum which is faint to the eye, but chemically very active, finds the bright lines of oxygen most clearly and unmistakably defined. This is neither the first of Dr. H. Draper's noteworthy achievements in science nor by any means the first great American success in solar spectroscopy. We owe now to America (to mention only a few points) the discovery of the (partial) gaseity of the solar corona, the recognition of the true solar atmosphere (Young's discovery in 1870), Young's mastery of the problem of indicating the sun's rotation by its spectroscopic effects, H. Draper's photographic spectra of stars and planets, and now this most important discovery of oxygen in the sun—a discovery which, important though it is in itself, is but the first step in a new path of research. In some of these great achievements English observers have been independently successful. We trust that they will not long leave unexplored the newly-opened field of labour, and that before long we shall hear of their taking an active part in determining under what conditions the solar oxygen subsists, what part of the sun it chiefly affects, and what part it plays in solar disturbances. We may also hope to hear shortly of the discovery of other elements in the sun by this new and promising method.

CAMERA WORK WITHIN A FIVE-MILE RADIUS OF CHARING-CROSS.

There are numbers of aspirants for photographic fame who often feel at a loss for a suitable district in which they can practice their art and mystery undisturbed and unchallenged within an easy walk of London. A long journey costs both time and money, and is otherwise inconvenient more often than not.

If I suggest Hampstead and Highgate and the north and north-western districts of suburban London as a field for labour, I may be looked on as an enthusiast who would enjoy, and think suitable ground, Covent Garden or Tottenham Court-road. Nevertheless, if the photographer will pack up his traps and accompany me I will endeavour to show him such a district as will make his photographic heart leap with joy.

Now, if the artist be well supplied with good plates and a couple of lenses—a single and a wide-angle combination—I am ready, and we will start from, let us say, the "Duke of St. Alban's," at the foot of Highgate Hill. Omnibuses run every twenty minutes from St. Martin's Church, and occupy about three-quarters of an hour on the journey, or a little longer. We will at once cross to the opposite side of the road, and take the footpath leading to Hampstead. A few yards further on we can get to work with as much comfort as though we were miles away from town. Three or four views may be taken about here of trees, water, and general landscape, and the picturesque shape and grouping of the trees will at once strike the beholder. These being secured, a sharp turn to the right will bring us to the Highgate Ponds, which we will leave for the present and walk up the hill on our left. It would not be imagined that such views could be found in such close proximity to the metropolis.

Now we may as well set to work in earnest, for there is no lack of subjects to suit the most fastidious taste. Capital foregrounds with the wooded hills and undulating meadows of Highgate will be found in one direction, and a glorious panorama of London in another, while water, trees, and rustic fences are spread about in a lavish manner, only waiting to be taken. More than one day may be profitably spent within an area of a quarter of a mile from where we stand. We will only expose a couple of plates, then turn back and cross by the end of the Ponds into Millfield-lane. A couple of plates exposed in the lane itself before we go any further will perhaps be as well.

We once more start in a northerly direction. An old farm, called "Millfield Farm," on the right-hand side of the road, will furnish a good many studies of trees, water, and old buildings. Our road still lies northwards along the lane, until we debouch on the highway between Highgate and Hampstead. Bearing away towards Hampstead we come to a lane on our right, from which we can obtain an entrance to the woods which skirt the road. These are Caen Woods—the well-known "happy hunting grounds" of the entomologists and artists. We shall find many sylvan bits here well worthy of a plate; but, as we are a little beyond the five-mile radius, we will retrace our steps, and turn back towards Highgate, in which quaint old place several good street views may be had.

Crossing the main road from London we push on towards Hornsey. Right and left of us views surpassingly beautiful meet our gaze, and by occasionally making slight detours we may secure some admirable pictures. We have certainly found work for many days already; still there are in the direction of Hampstead quite as many more, so we will have a look round if my companion is not quite "done up."

Taking the main road to Hampstead—in fact, retracing our steps by Caen Woods—we come to the well-known hostelrie of "The Spaniards," which, if agreeable, we will enter and refresh ourselves. On again, and now we have a different class of scenery—sandy heath, fir trees, gorse, and bracken spread over many acres, with grand panoramic views over I do not know how many counties. Continuing our way over the heath in the direction of Cricklewood many good views may be secured, and on the borders of the heath some quaint old houses will be worth a plate.

We now turn into the road by Jack Straw's Castle, and, leaving Heath-street to our left, descend the hill by Frognal Hall to the Priory, now no more, as it is in process of demolition, to make way, in all probability, for some building more modern and less picturesque. There is, however, a very pretty lane scene looking from the Priory gate towards the church, which should not be neglected.

The old church, covered as it is with ivy, is worth another plate; but as we are tired I don't think we can do better after all this hard work than go and have a comfortable and substantial meal at the "Wells Tavern," within a few minutes' walk of the Hampstead Heath station on the North London railway, or the omnibus to the West End, *viâ* Tottenham Court-road. Except on a bank or other general holiday the photographer or artist is as free from interruption as though he were a hundred miles away from the metropolis, and will certainly find as much material on which to exercise his abilities. There are several other routes in this neighbourhood abounding in good things, but for the present we will rest contented. Edward Dunmore.

SCIENTIFIC JOTTINGS.

It will be remembered that a few months ago an interesting discussion was carried on in our pages referring to the reciprocal relations of the haloid elements. We may refer those of our readers who are interested in the subject to page 109 of the *Journal of the Chemical Society*, where there is a short *résumé* of a paper from a foreign source upon the subject. The gist of it may be summed up in the following extract:—"It was found that the amount of chlorine replaced by bromine, the two being present in molecular proportion, is directly proportionate to the atomic weight of the elements, provided they belong to the same group." The experiments were made in sealed tubes.

From the same source we find further particulars of an improved method of making hydriodic acid by diminishing the proportion usually recommended of the iodine employed. This in most text-books is twenty parts of iodine to one of amorphous phosphorus and fifteen of water, which is distilled after moderating, by cooling, the action at first set up. In the new method ten parts only of iodine are employed to one part of ordinary phosphorus. No water is at first added, but the whole heated for a short time in a flask filled with carbonic acid, and then, after cooling, four parts of water added and the mixture distilled. The result is stated to be quite colourless, containing no free iodine; while in the old way the acid obtained was very weak, and contained much free iodine.

The subject of fading through the influence of sulphurous fumes of one kind or another produced by the burning of gas in dwelling-places has often been discussed. Some light has been thrown upon it lately by Mr. W. C. Young, who, in the *Analyst*, shows that the only result of such combustion of gas is practically sulphuric acid.

A new material likely to be of use to photographers has been described. It is termed "thao," and is the gelatinous part of certain *algæ* used in Cochin China. It is stated that the same material can be extracted from certain seaweeds on the coast of Bretagne. When macerated in water for twelve hours it may be dissolved by the aid of heat in ten or fifteen minutes. It possesses several very important qualities which—although looked upon from a manufacturer's point of view as defects—would be positive advantages to the photographer. Thus it is "contaminated" with a yellow colouring matter, which might be a considerable gain if it could be utilised for emulsion work, though for carbon tissue its presence would be fatal; it can, however, be got rid of by long-continued boiling. Then, again, "thao" can only be dissolved by heat, and its solutions do not turn mouldy. If it should be an easily-procurable material there seems to be a possibility of its becoming a substance of considerable importance to photographers.

In a communication to the *Chemical News* for the 3rd and 10th inst. Mr. J. Townshend Austen, of the New York School of Mines, describes a number of little "wrinkles" for use in the chemical laboratory, some of which we may extract with advantage for photographic readers:—

1. *Felt Pads as Supports.*—He recommends pads of felt half-an-inch thick to be always at hand, for the purpose of supporting beakers containing hot solutions or other hot vessels which are liable to crack by sudden cooling. He also recommends these pads to be used as supports for all glass vessels, as they, being as a rule not so well annealed as smaller ones, are liable to fly and snap upon being briskly put down upon a table where even an excessively-minute particle of grit happened to rest.

2. *Microscopic Crystallisation.* — He gives a method of producing crystals for examination under the microscope—one which would answer well if they required to be photographed. He places a drop of the liquid to be crystallised upon a watch glass, then covers it with another similar glass, which causes the drop to expand to a film, and finally places a small quantity of ether upon this upper glass. Its evaporation produces a degree of cold which causes the crystallisation to take place at once, and the rapidity or slowness of growth can be regulated by the amount of cold allowed to be produced by the ether evaporation.

3. *Washing Precipitates Out of a Flask.*—Those who have made chloride of gold by precipitating with iron, washing, and redissolving will have experienced considerable difficulty in washing out the last traces of gold. Mr. Austen proposes an excellent method. He heats a flask half full of the liquid containing a precipitate, and then dexterously conveys it, mouth downwards, without spilling any of its contents, into an evaporating dish. After the liquid has cooled, and thus caused water from the evaporating dish to rise into the flask, he says:—"By gently shaking the flask the liquid slaps against the top (bottom) and sides, thus dislodging completely all adhering particles. A slight revolving motion is then given, and the heavy solid particles go quickly down through the neck of the flask into the dish. After all the substance is removed the glass is gradually tilted, and the liquid allowed to run out. This operation also requires a little skill. If a bent glass tube be introduced into the flask a quick exit of the contained liquid is effected."

4. *Cleansing Instrument.* — Mr. Austen pictures a little wire contrivance consisting of three wires bent with claw ends and twisted together to within about a couple of inches of their ends, so as to form a long handle on which runs a wire ring, which, by sliding up and down the three claws, compresses them to any desired extent. It is useful for grasping wet paper, small towels, &c., &c., for the purpose of introducducing into bottles, &c., for cleansing them. It is a very handy contrivance; but Mr. Austen makes a great mistake in supposing it to be new. It has been in use as far as our memory carries us back, and has mostly been employed as an aid in extracting corks which had been pushed into the inside of bottles.

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Meetings of Societies.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The monthly summer meeting of this Association was held on Saturday last, the 25th ult. At the invitation of the President the members met at his residence, Clare Mount, Wallasey. Unfortunately the weather turned out in every way unfavourable for photography, and, though a walk was taken to the old tower, it was considered useless to expose a single plate. On returning to Clare Mount two attempts were made to obtain on a wet plate a group of the members; but, although exposures of a minute and a-half and three minutes were given, only a faint positive was the result.

The rain coming down heavily an adjournment was made indoors, where the members proceeded to do justice to the President's hospitality by demonstrating that, however skilled they were in preparing emulsions, they were no less adepts at the tea and coffee process, and were capital hands at cleaning plates.

The President showed a number of negatives and prints taken during his tour in Switzerland and Yorkshire, and afterwards took the members into his dark room, where he gave a demonstration of the manner of preparing gelatine emulsion by Mr. Wratten's method. He coated a number of plates, brought by the members, with gelatine emulsion, and finally took an enlargement by Leach's process, with the aid of the sciopticon.

Mr. W. E. Potter demonstrated the manner in which he packed his whole-plate camera and double backs on his bicycle, and stated that he found no inconvenience in travelling thus laden. He exhibited a print of a pretty view near Llangollen which had been taken on one of his trips.

Mr. J. H. T. Ellerbeck showed a number of fine prints taken in Wales.

Mr. J. A. Forrest exhibited a number of beautiful views, chiefly of the interior of the Town Hall, Manchester, taken by Mr. J. Pollitt on wet collodion plates. Although the exposures varied from two minutes to six hours all were charmingly soft and full of detail, without any of the blurring so often seen about the windows of interiors. They were doubly interesting to photographers, as each print was marked with the name of the lens by which it was taken, size of stop, and length of exposure.

Mr. W. Roper, of Lancaster, was elected a member of the Association.

The usual monthly evening meetings will be resumed at the Free Library on the last Thursday in September.

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Correspondence.

IMPORTANT IMPROVEMENT IN GELATINE EMULSIONS.

To the Editors.

Gentlemen,—Seeing by the note at the head of "Answers to Correspondents," on page 408 of The British Journal of Photography of last week, that some correspondence had been unavoidably left over for future publication, and having read in your contemporary of the same date a letter from Mr. Herbert Kerr claiming the merit of Mr. Wratten's discovery for Colonel Wortley, we shall take the liberty of assuming that he may have addressed you also on the subject, and accordingly we reply in anticipation.

As Mr. Kerr does not seem to have profitably read your article of the 17th instant, or perchance may not, from want of theoretical and practical knowledge, be able to understand its purport, permit us to tell him that we do not pour out the emulsion to set, nor wash it with water, nor add alcohol to it for the *mere* final purpose of extracting the *water*, as *did* Colonel Wortley. We pour the alcohol into the emulsion for the specific purpose of extracting the nitrate salt formed by double decomposition, well knowing that in extracting the water we extract that salt also. This all-important fact Colonel Wortley utterly failed to grasp. Why?—We are, yours, &c.,

38, *Great Queen-street, Long Acre,* Wratten and Wainwright.
August 27, 1877.

To the Editors.

Gentlemen,—Surely it must be a misprint in the letter of Messrs. Wratten and Wainwright, in your last number, when they speak of methylated spirit costing 2s. 6d. a pint. Buying retail a single pint of the very best quality, and from a first-rate chemist near me (not the neighbouring oilman), I only pay 1s. for an imperial pint, or, if I take a gallon, 6s. Were I to take the trouble of sending some little distance I can purchase, at one of the oldest and most respectable shops in the trade, the very best 63° o.p. for 6d. a pint, or 4s. a gallon, whether I take a pint or a gallon.

I have this morning, being near the place, purchased a pint at the latter price, and I can assure your readers that it is thoroughly to be relied on.—I am, yours, &c., P. Le Neve Foster.
Society of Arts, Adelphi, August 25, 1877.

To the Editors.

Gentlemen,—The temptingly-rapid method of preparing gelatino-bromide emulsion, in your last week's Journal, by precipitation with alcohol, I have found, in the few experiments I have made, anything but satisfactory.

There was no difficulty in effecting the precipitation, but there was a *very great* difficulty in redissolving the precipitate. I am, in fact, very doubtful if this precipitate will redissolve or emulsify smoothly, as the result seemed to partake much more of the character of a mechanical mixture than a solution. The plates coated with it were very coarse and translucent. I have not exposed or developed any of them, as their unpromising appearance satisfied me as to the quality of the image I might expect. The precipitated gelatino-bromide was digested with the proper quantity of water in a water bath, at the temperature of 150°, with frequent agitation for about an hour.

Perhaps some other experimentalist will be more successful, and, if so, I should be pleased to know at what point of the process I failed, as I closely followed the published formula, and the manipulations are very simple.—I am, yours, &c., E. D.

29, Torriano Avenue, N. W., August 22, 1877.

THE VALUE OF ALCOHOLIC WASHING FOR EMULSION OR PELLICLE.

To the Editors.

Gentlemen,—I think you will find that you have in your last issue given credit to the wrong person (Mr. Wratten) for originally discovering the above. I find it was announced, and, I believe, first, by Colonel Stuart Wortley, to the Photographic Society (see The British Journal of Photography, June 30, 1876), thus :—

> "When the pellicle is set in the dish into which it has been poured it is cut up with a clean slip of glass and put into a bottle; it is then rapidly rinsed with three or four changes of distilled water, and then with two changes of methylated alcohol, in the latter of which it is allowed to soak for a quarter of an hour. It may then either be taken and, after blotting off the superfluous moisture, be dried by a gentle heat, or it may be left in a bottle with clean alcohol, which I find to be by far the best method of preserving sensitive gelatine pellicle; and under any circumstances washings of alcohol are most important, as they extract all the water" [*this is the point*] "from the gelatine, and render it far easier to thoroughly dry the pellicle. I also find the diluted alcohol useful in the preparation of the *collodion* pellicle, but I need hardly point out that in *that* case it must not be used too strong, or it will cause partial solution."

—I am, yours, &c., Herbert Kerr.

Junior United Service Club, S. W.,
August 22, 1877.

[The above letter was received by us too late to be inserted in our issue of last week. If Captain Kerr will again peruse our article he will find that the *modus operandi* there described is entirely different to that of Colonel Wortley.—Eds.]

TRANSPARENT SPOTS IN EMULSION PLATES.

To the Editors.

Gentlemen,—Since my letter to you of about a month ago I have been experimenting with a view of finding out the cause of, and remedy for, the transparent spots in emulsion plates.

Thinking over the matter, it struck me that in all probability the preservative had something to do with the spots. On development no detail was visible in them, and they remained unchanged in appearance. On the application of the hyposulphite, however, they dissolved away, leaving the places quite transparent. Nothing whatever could be seen of them previous to development—in fact, the plates looked perfect.

The circumstance which led me to believe that the preservative was at fault was this :—I had coated a plate with emulsion and exposed it, the subject being two villas. On development a long streak of undecomposed bromide, similar to these transparent spots, became visible, and was dissolved away by the hypo., leaving a transparent streak. The other parts of the picture were perfect. I could not then account for the streak, but next day I prepared another plate, exposed, and this time no fault was to be found. Thinking the above circumstance over, and seeing nothing for it but that the preservative was the cause, I cut one of the plates I had reason to believe was infected with spots in two. One half I flowed over with a solution of tannin in alcohol; the other I left plain. They were exposed together, and on development the tannin plate showed the spots certainly, but they were almost entirely full of detail, while the other plain plate gave transparent ones. In the tannin plate and in the other all the spots had a minute speck in the centre; but what was most observable was that in the sky spots on the *tannin plate* did not show more than the small speck, whereas the spots on the plain plate were transparent. This, I thought, proved that the preservative had something to do with the evil, and I believed I could guess how much.

Mr. Magar has said that the emulsion must be well shaken, and I cordially endorse his opinion. To my mind spots are entirely due to the insufficient shaking of the emulsion, and I have endeavoured, with success, to prove it. Having a little of the emulsion that had given me so much trouble left, I gave it a very severe shaking. The bottle containing it was only a sixth or so full, and I shook it for some four or five minutes. Allowing it to stand for a minute or two I coated a plate and exposed it, and on development not a spot appeared. Now, how was this? Before the plates were covered, but now not one speck appeared. The reason I believe to be this :—The emulsion whilst standing at rest in the bottle forms into clots, imperceptible to the eye when coating a plate, and on these the preservative does not seem to have acted.

I do not presume to be an adept in the chemistry of photography, but perhaps some of your most talented readers may be pleased to express their opinion on the subject. My only object in writing this is to let you know how far, and with what success, I have overcome the difficulty. I may say, in conclusion, that I am only an amateur with few conveniences and opportunities for practising photography.—I am, yours, &c., Edgar E. Wigglesworth.

Greenfield House, Farnworth, near Bolton,
August 27, 1877.

Miscellanea.

Chrysoïdine Varnish.—We have been requested to state that this varnish, of which so much as been said of late, may be procured at the establishment of Messrs. Marion and Co., Soho-square, London.

Instantaneous Dry Plates.—From a note we have received from Captain Abney, since the termination of the Plymouth meeting of the British Association, we learn that on the Tuesday of the meeting he went to see the torpedo explosion at Picklecombe Fort, and got a capital instantaneous view of the explosion and breaking waves. Captain Abney adds that he is enchanted with the behaviour of his new plates, of the general preparation of which we have already published details.

Prudery ad Nauseam.—The other day a Jew was fined forty shillings for selling a photograph of the *Greek Slave*. Now, of all things, who would expect to find a counterfeit presentment of this cold inanity of a statue coming under Lord Campbell's act? If nudity is to be held synonymous with indecency, and the sale of photographs is to be confined to the leering, towsled, semi-nude Jezabels who call themselves actresses, is it not time we shut up South Kensington, and brought our statues to the hammer, or rather the hammer to our statues, and thus find refuge from the pruriences of art in pulverisation?—*Funny Folks.*

Medal Awards at the Royal Cornwall Polytechnic Society.—Just before going to press we have received an abstract of the medal awards made in connection with the photographs at the Exhibition of the Royal Cornwall Polytechnic Society, which is now open. For works exhibited by *professional* photographers four silver and three bronze medals have been awarded respectively to Messrs. H. P. Robinson (silver); F. Frith and Co. (silver); George Nesbitt (silver); Reuben Mitchell (silver); J. Millman Brown (bronze); W. Gillard (bronze); William Harrison (special bronze). For works executed by amateurs only one silver and two bronze medals have been awarded, viz., to Messrs. Edward Brightman (silver); F. Beasley, Jun. (bronze); H. Manfield (bronze). We hope in our next to publish a detailed report.

The Recent Eclipse of the Moon.—The Rev. Dr. Pritchard, writing to *The Times* of Tuesday last respecting the observations made at the University Observatory, Oxford, says :—"At 9 p.m., about a quarter of an hour before contact with the earth's shadow, and when the moon was enveloped in the penumbra, a very slight violet or slate-coloured light was diffused over the moon, which became more noticeable on its less-illuminated districts. At 9.25, when the eclipse was well advanced, to the naked eye the covered position of the moon assumed a dark slate colour, ending sharply and well defined; in the largest of the three telescopes the appearance of colour and definiteness of terminating edge were much less apparent, the smallest telescope (of two and a-quarter inch aperture) appearing to be the best adapted for viewing the increase of the shadow. At 9.50 the moon's limb was much more distinctly traceable than the interior of the disc. At 10.20, one minute after totality, the colour of the covered moon is similar to burnished copper, but not of uniform brightness, a bright patch in the north-east (approximate position angle 310 degrees) being a remarkable feature. The 'following' quadrant much darker than elsewhere. At 11.10, middle of the eclipse, the second quadrant (south-east) is the brightest visible portion. The limb is everywhere brighter than the interior. The more noticeable and prominent craters can all be made out, but with no detail. Copernicus is of a very bright red colour, not unlike that of Mars, then visible to the east of the moon. The general tint approaches that of a blood red, and the distinctive coppery appearance is not very noticeable. At 11.50, as the end of the total phase approached, the light patch in the north-east became very obvious. At 12.10, seven minutes after totality, there was a good deal of light on the 'following' limb, and the colour more red than copper, and apparently redder than it had been at a similar distance of time before totality.—The preceding observations were made chiefly by Mr. Plummer. But before and during the progress of the eclipse many photographs were taken by Mr. Jenkins, with Dr. De la Rue's thirteen-inch reflector, and when these are critically scrutinised it is hoped that some light may be thrown on the extent of the earth's atmosphere, because it may be assumed that, owing to the absorption of actinic rays by our atmosphere, the photographic shadow may extend and be traceable a long way beyond the true penumbra. The exposure of a photographic plate to the telescopic image of the totally-eclipsed moon for two minutes produced no effects as yet discernible."

EXCHANGE COLUMN.

I wish to exchange a Solomon's £5 telescope and a ten and a-half inch plate electrifying machine for a sciopticon.—Address, F. M. S., 30A, Flower-gate, Whitby, Yorkshire.

Wanted, an extra-rapid doublet, six inches focus, in exchange for a half-plate portrait lens, six inches focus, with diaphragms.—Address, M. Newman, 21, Marsden-square, Manchester.

Hart's portable studio, cost £15 15s., and *carte* burnisher, offered for *carte* lens and 12 × 10 rolling-press. Also wanted, Moulton's washer. — Address, Langton, photographer, South Hackney, London.

I wish to exchange a first-class rolling-press, gun-metal bearings, &c., size of plate 11 × 8, for a good half-plate camera or other photographic apparatus.—Address, W. Slater, 84, Jamaica-level, Bermondsey.

Mr. Maddison, artist, Huntingdon, wishes to exchange the following for anything useful:—A 12 × 10 flat bath, made by the Autotype Company; a 12 × 10 Fowke's folding camera, No. 1 and No. 5 Dallmeyer's triplets, a quick-acting "J. S." *carte* lens, and *carte* camera for four *cartes* on whole plate.

I will exchange a photographic apparatus, complete, for plates nearly two inches square, with stand, camera, chemicals, pipettes, &c., for producing photographs on paper, which cost when new £2; also a lever plate-cleaner for medium-sized plates; for a *carte* or cabinet rolling-press or anything useful to an amateur photographer.—Address, A. A. C. Swinton, Kimmerghavie, Dunse.

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ANSWERS TO CORRESPONDENTS.

Photographs Registered—

John Horsburgh, Edinburgh.—*Photograph of the Rev. Thos. McEwen.*

☞ *Correspondents should never write on both sides of the paper.*

A Beginner.—You will hear of a suitable opening by advertising.

M. S. S. K.—The solution of gelatine is much too strong. Reduce it by two-thirds.

D. Todman.—For photographing on wood you will find the carbon process most expeditious.

Assistant.—We do not at this moment recollect the address of any one who supplies colours for ceramic enamels.

Hector.—To obtain the warm tones you so much desire omit the citric acid from the developer, using acetic acid as a substitute.

Capt. J. E. G.—We have not obtained any further information concerning chrysoïdine beyond that given in a paragraph in another column.

J. M'L. (Woolwich).—The enclosures are fair specimens of portraits taken in the open air. They might be printed rather deeper with advantage.

M. N. O.—You may omit the oil of lavender if you cannot procure it easily. By sending the print to the Publisher of this Journal, along with full particulars, it will be registered.

Chemicus.—We have been both amused and astonished at the statements which elicit your letter (for which—thanks), and which, owing to special circumstances, we had not previously seen.

G. S. Smith.—The opinion of your architect is quite sound. You should follow his advice implicitly in every respect, but more especially in regard to the pitch he proposes giving the roof. As *you* have drawn it, it would never answer.

Y. A. H.—Yes; pyrogallic acid will develope a wet collodion plate, but it is much less energetic than protosulphate of iron for that purpose. According to our present light it is much better to develope negatives with iron and intensify them with pyrogallic acid.

Silver Beam.—All we know is that the india-rubber is put into a "masticator" with sulphur and other ingredients, and is there brought to such a consistency as to permit its being moulded in any desired form, the application of heat effecting the vulcanisation.

T. M'Dowall.—By making use of a concave spectacle lens having a very large radius of curvature a good photograph of the sun may be obtained. Grind one surface of the glass until it is very coarse, then blacken it with black varnish, and use the other surface as a reflector.

G. E. Franklin.—Your error doubtless lies in expecting that an albumen negative film is as dense as a collodion film. On the contrary, it is very thin and translucent. You must also bear in mind that the development of an albumen negative is a very slow process as compared with one on collodion.

J. W. L.—Ground glass may be imitated by a varnish composed of—

Sandarac	90 grains.
Mastic	20 ,,
Ether	2 ounces.
Benzole	1 ounce.

The proportion of the benzole added determines the nature of the matt that is obtained.

R. J. S.—Having examined the lens (which may be obtained on application to our Publisher) we have no hesitation in pronouncing it to be a common French lens in an English mount. Its nationality would not interfere with its working, but unfortunately it is *very* much over-corrected. It will be useful if converted into an objective for a magic lantern; but as a photographic lens it will cause much trouble unless the camera be fitted with a ground glass specially adjusted for using with the lens.

R. Ridley.—Although we do not counsel the use of a gutta-percha bath, yet, for the special use to which you purpose putting it, we cannot offer any serious objection provided that you clean it very carefully with diluted nitric acid, which ought to be allowed to remain in it for several hours. In the olden times, when gutta-percha baths were much used for holding silver solutions, it was customary to rinse them well out with a strong solution of cyanide of potassium, and to follow this (after an intermediate washing with water) with a similar treatment with diluted nitric acid. To this succeeded two or three coatings of varnish. Even after such elaborate treatment the silver solution would, in the course of two or three weeks, become affected by the organic impurities of its holder.

W. Weston.—Our correspondent, with reference to his letter at page 408 desires us to make a correction. In saying that he could produce, at will, visible impressions with a moist organifier, he meant it to be understood as applying to plates prepared by the bath, and not by an emulsion process. A further communication from our correspondent will appear next week.

C. Brindley Beddoc.—If the negative be still unvarnished the surface markings may, probably, be removed by friction with a tuft of cotton wool. If they do not yield to this treatment, dissolve them out by touching the spots with tincture of iodine, followed by the application of cyanide of potassium. Nitric acid, also, would effect their removal. As in either case the image will be totally removed, recourse must be had to "retouching" in order to supply the details.

D. E. B.—Try the following:—Produce by any of the known methods (carbon, by preference) a transparency upon the hollow side of a slightly-curved glass, and, after "touching," or even tinting, it to as great an extent as you consider desirable, pour over the picture a sufficient quantity of fine plaster of Paris (mixed with water to the consistence of cream) to give an opaque backing to the photograph. If preferred, a little aniline or other dye may be mixed with the water so as to impart a slight tone to the whites.

Toning Transparencies for Burning-in.—R. C. writes as follows:—"In answer to your correspondent, Dr. John Nicol, as to there being a mistake in the length of time taken to tone a transparency suitable for burning-in, there is no mistake in my case. I have never been able to *thoroughly* tone a transparency by any published formula in less than six hours. I shall feel indebted to Dr. Nicol if he will give a formula by which they can be *thoroughly* toned in ten or twenty minutes, and of a good dark tone."

T. R. Gray.—We have never experienced much difficulty in obtaining yellow calico of a kind suitable for the window of a tent or dark room. But by adhering to the following directions, which we received from one who is practically acquainted with dyeing, a yellow colour of good quality may be obtained:—In a quart of water dissolve an ounce of acetate of lead, and immerse the calico in this solution. Then transfer it to a solution of bichromate of potash of a similar strength, and in which has also been dissolved a little gelatine.

Mounting Enamelled Prints.—J. M'Lachlan is desirous of knowing what mountant is generally employed for enamelled prints. He says:—"I use starch (Glenfield) which causes the print to lose nearly all the smooth appearance of the enamel collodion, and seems to allow it to sink into the pores of the paper by softening it. I have tried the addition of chrome alum to the gelatine, but it does not prevent it. The plates coated with gelatine were immersed as directed in the Almanac for 1877. Rolling does not restore the brilliancy."——Can any reader give the requsite information?

M. D. writes as follows:—"In the first leading article in the Journal of the 17th inst., in regard to Mr. Wratten's new method of washing gelatine emulsions, you say (see bottom line in second column) it may 'be at once dissolved by adding the requisite proportion of warm water.' Does this mean to add two half ounces of water to replace the two (nearly) poured off with the alcohol? or does it mean to dissolve the emulsion *first* and then add sufficient water to make up one ounce of the emulsion? Could you also enlighten me as to any method of using acetate of soda in the alkaline developer to give the pleasing tone to transparencies that we are able to get by using it with the iron developer in the usual wet-plate process? I succeed well in the latter, but cannot manage it in the presence of the ammonia."——In reply: Mr. Wratten recommends that one half of the required quantity of water be added to the pasty, precipitated gelatine, and a gentle heat applied; and that the remainder of the water, previously warmed, be added a short time afterwards. With respect to the use of acetate of soda in the alkaline developer we refer our correspondent to a communication on this subject, by Mr. William Brooks, to the South London Photographic Society, in which is comprised all that has yet been published.

Erratum.—In our notice of the proceedings connected with the recent meeting of the British Association, in our last number, Mr. William Spottiswoode, F.R.S., the President-Elect, was stated to be the treasurer of the Association. It should have been "Treasurer of the Royal Society."

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METEOROLOGICAL REPORT.

Observations taken at 406, Strand, by J. H. Steward, Optician.

For the Weeks ending August 29, 1877.

These Observations are Taken at 8.30 a.m.

Aug.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks
16	29·94	W	60	65	76	59	Cloudy
17	29·95	W	59	65	75	56	Cloudy
18	30·10	W	60	64	78	56	Cloudy
20	29·83	SW	66	70	82	63	Cloudy
21	29·55	SW	63	69	77	64	Cloudy
22	29·64	W	60	63	75	59	Cloudy
23	30·01	WNW	53	57	69	50	Fine
24	30·21	W	53	56	69	56	Dull
25	29·91	E	57	60	67	53	Dull
27	29·91	SW	63	65	68	57	Dull
28	29·75	W	60	61	72	61	Raining
29	30·02	NW	58	63	—	57	Cloudy

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 905. Vol. XXIV.—SEPTEMBER 7, 1877.

BINOCULAR AND MONOCULAR VISION.

It is not long since we heard an eloquent suburban preacher, in the course of some remarks on the sad fate of those who were deprived of that unspeakable blessing, sight, get a little beyond his depth when, leaving the emotional he ventured into the domain of physical science, and with more eloquence than perspicacity hazarded the assertion that a flood of light of double the intensity is poured into the brain of an individual possessing two eyes than is received by a person limited to one organ of vision. When we afterwards mildly demurred to the accuracy of the statement, and, by way of counter assertion, said that, strange though it might appear, an object seen by one eye only is nearly as brightly lighted as when it is observed by both eyes, we were reminded that by increasing or diminishing the area of aperture in the object-glass of the telescope the luminosity of the image produced by such object-glass was thereby increased or diminished, and that the inspection of an object by means of one or of both eyes placed the individual on a par with the user of a telescope in which, by means of a diaphragm, the aperture of the object-glass is increased or diminished in the ratio of one eye *versus* two eyes.

Now, although at first sight the sophistry of this argument appears plausible, it is at the same time totally incorrect. If an object be examined first with both eyes and then only with one eye, it will be found that in both cases the luminosity of that object is equal. Not *quite* equal, we hasten to observe; for the amount of the degradation of the luminous appearance of an object when seen by only one eye instead of two is computed to be a one-thirteenth part. One writer has said that it is one-tenth or one-eleventh, but in this matter we are inclined to trust several carefully-made experiments by Sir David Brewster, who, with Dr. Jurin, found it to be what we have just stated.

Should the question be asked as to how this is to be accounted for, we should much prefer evading it, for the amount of actual knowledge possessed on this subject is not such as we can fall back upon with anything approaching to full confidence. The opinion generally held, however, is that, by the mere act of closing one eye, the pupil of that which is left open dilates to nearly twice its former dimensions in order to compensate for the loss of light arising from the shutting of the other—a fact first mentioned by Bacon and subsequently affirmed by Brewster, who finds in this provision to supply the proper quantity of light when only one eye is used a purpose which had escaped the notice of all previous writers on optics, namely, that in binocular vision as certain parts of objects are seen with both eyes and certain parts only with one, if the former were seen twice as bright as, or even much brighter than, the parts seen with one eye the object would appear spotted from the different brightness of its parts, and that owing to the provision alluded to we have equality of illumination.

This subject is, as we have hinted, still obscure, and no scientist has yet made it specially his own by thorough investigation. Although it is not a topic possessing any direct photographic application, it is one that proves of interest to all who can look a little way under the mere manipulatory surface of our art-science; and hence, when we saw that among the subjects put down on the *agenda* sheet, or daily journal, of the British Association was a paper by Mr. Sylvanus P. Thompson (Section A., Tuesday, August 21), *On the Relative Apparent Brightness of Objects in Binocular and Monocular Vision,* we attended in the hope of hearing what could be said concerning this phenomenon.

Starting with an allusion to the common idea of objects appearing brighter when seen with two eyes than with one, Mr. Thompson suggested as a means of submitting this question to the test of photometric measurement the statement which we insert below. We may here, however, premise that although he submitted for examination the instrument now to be described, the exhibition was made under such circumstances—that is, in daylight and under great pressure of time—as precluded the possibility of its being examined or even well understood by those present. The following epitome of Mr. Thompson's paper will place each reader in an equally good position as regards a clear understanding of the subject as the ten or twelve persons present in the section during the reading of the paper:—

The comparison photometer employed consists of a cardboard screen, having an aperture divided into two equal portions. One half is covered with tissue paper and illuminated directly from behind. Behind the other half is set, at the polarising angle, a mirror of black glass. Light from a second lamp falls upon a screen of tissue paper, whose light is then reflected in the mirror. Thus the two halves of the aperture may be illuminated equally, but with light in one case wholly unpolarised; in the other, wholly polarised. Let two Nicol prisms be now taken, having their principal sections placed parallel and perpendicular respectively to the plane of polarisation of the mirror, and let one Nicol be placed in front of each eye. One eye only will receive the whole of the polarised light, while the unpolarised will be equally distributed, half to each eye. The total amount of light received upon the retinal surface will be the same from each half of the aperture; but their apparent illuminations will be unequal, that of the polarised light appearing the greater. By comparing the distances at which the lamps must be placed, it appears that light is more powerful in producing an effect when concentrated upon one eye than when equally distributed to the two, though, according to what law, experiments are not yet sufficiently numerous or exact to determine; but, on the other hand, the light so concentrated on one eye does not produce the sensation of twice as much illumination as the half of the light viewed by both eyes at once.

Admitting that the subject is still obscure, we hail with pleasure every effort to throw light upon binocular and monocular vision.

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METHYLATED SPIRIT AND ITS PRODUCTS.

In our last we dwelt upon methylated spirit more in a commercial sense than otherwise. We may now allude more particularly to its physical and chemical characteristics, and to those of the products obtained from the spirit. There is a tendency in discussing ether and other liquids to speak of the raw material, the methylated spirit, as if it were a mixture of two definite chemical compounds—methyl alcohol and ethyl alcohol or ordinary spirit of wine—but nothing could be more misleading.

The name "methylated spirit" itself, given by Act of Parliament, has a tendency to favour the delusion; but we must state that the spirit—impure methyl alcohol, known also as "wood spirit," "naphtha," or "pyro-acetic spirit"—is a mixture of a very great variety of substances, and is purposely selected of an impure and coarse kind in order fully to carry out the purpose of its admixture. The production in the laboratory of pure methyl alcohol is a matter involving so great time and labour that we may at once disabuse our minds of the idea that we can predicate from its action what would be that of the methylated spirit when acted upon by certain chemicals—as, for instance, in the manufacture of ether and chloroform. Taking chloroform as an example, we know that when pure methyl alcohol is acted upon by distillation with bleaching powder the product is chloroform—just the same as if pure spirit of wine were used. But, if the manufacture were carried on with the crude wood spirit or the methylated spirit, the product would be entirely different. It would be specifically lighter, and possess a nauseous, tarry odour, and, if inhaled, would produce most unpleasant sensations—so much so that it has been said that an actual poison is produced by the process of manufacture. This, however, would not interfere with the restricted use it is put to in photography, the solution of amber and india-rubber or gutta-percha including nearly all its uses. Though the cost of the two raw materials is so very different, there is not more than fifteen to twenty per cent. between the prices of pure and methylated chloroform, owing to the chief element of cost being the labour and time spent upon the process of conversion.

The disagreeable odour, which so easily enables us to detect the methylated spirit from the pure, is almost entirely lost in the process of ether manufacture; so that when the two classes of ether or of chloroform are compared it is often difficult to state certainly which is from methylated and which from pure spirit, the more penetrating odour of the new compounds so effectually covering the slight trace of foreign smell. Hence a quick and easy method of analysis would often be of service. Unfortunately, however, there is not any easily-applied method, two characteristic ones which have been recommended being beyond the reach of amateur chemists. We may briefly note them:—The first consists in converting the spirit to be tested into some of the coloured aniline derivatives, when so small a quantity as one per cent. may be discovered. If the spirit were pure the colour will be reddish, but if even the small proportion named be present the colour will be violet. The second process consists in distilling a few ounces of the sample under examination successively with alkali, acid, and, finally, carbonate of potash, the final product—about an eighth of the original bulk—containing all the methyl alcohol there may be present. The specific gravity is taken, and from the tables the amount of alcohol present is estimated, and, finally, a rough estimate of the methyl alcohol is obtained by the difference between the amount so obtained and that deduced by oxidation.

The most important question for consideration remains. Seeing the large quantity of ether consumed in the manufacture of collodion, is there any practical difference between the pure and methylated? Theoretically it might be answered there should not be if pure methyl alcohol were employed; but, as we have shown this to be impossible, it must be said that so many new substances might be produced belonging to a class whose characteristics would lead us to suspect danger to the bath from their employment, that the evidence would be against methylated ether when the highest excellence was desired.

Practically, in the course of a long experience with each, we give the palm to the pure ether, though we should not hesitate to employ collodion containing methylated even for particular work. For photographers who might make their own collodion the difference of price would form such an important item of saving as to lead them to decide in favour of the cheaper. We have compared the two classes of collodion for sensitiveness, and, though the difference is so slight as to be difficult of precise determination, we decidedly think that the pure solvents ensure the greatest sensitiveness.

We have so often heard the question discussed between both interested and uninterested—that is, makers and users of collodion—that we think it important to lay stress on the radical principle of the difference between pure methyl alcohol and common wood spirit. The former, when exposed to the action of sulphuric acid, is converted into methylic ether, as the spirit of wine is to ethylic ether, that is, the ordinary so-called sulphuric ether of the shops; but methylic ether is a gas requiring cold of 30°—C. to solidify, and boiling at 20°—C. Hence it is said it ought not to be present in the completed product; but, being very soluble in the ordinary ether, some portion of it must be present. This ether, however, might not of itself be injurious, but in the methylated spirit it would be accompanied with a number of compounds of acetone and other substances, which none but the most elaborate system of purification would get rid of—a system the costliness of which, if it were carried out, would make the methylated ether the more expensive of the two.

We are aware that the large collodion manufacturers employ the greatest care in the rectification of this ether—that their wares may be of great excellence; but we need scarcely appeal to the sense of smell of our readers to prove that something is left behind. We will not now pretend to say what that something is; but that it is a factor of importance may be proved by an appeal to another of our senses—that of feeling. Everyone who has worked in a small dark room for several hours together, or done much tent work when circumstances have compelled him to coat his plates inside his tent, can tell by painful experience the effect of methylated ether. The pain, smarting, and irritation of the eyes is, with some constitutions, almost insufferable, and is aggravated to a still greater extent if the collodion be old. But when pure ether is employed the effect upon the eyes that may be sometimes produced is of quite a different character; but it is far milder in degree, and in many respects unlike that caused by the methylated.

We have, we think, sufficiently placed the various aspects of the matter before our readers to enable them to form their own estimate, or to guide them in the institution of comparative trials on their own account.

We are now in a position to redeem our promise of giving a brief description of *Prince's Patent Kaleidoscope Album*, to which we have already made allusion as having been shown at one of the *soirées* of the British Association. It consists of a shallow case about twelve inches long, nine inches wide, and two inches deep, mounted on a stand so as to revolve similar to a swing glass. The back and front of the case are the same in appearance, and divided in the centre by a cross bar in such a manner as to make two windows on each side, through which the pictures are seen. The internal construction of the case—which is extremely simple, and cannot get out of order—is such that upon turning it over the leaves will slide or drop successively from the top window to the bottom, thus exhibiting the whole or any desired number of the pictures. The leaves are made with metallic edges to keep them straight, and have an extra thickness at each end to keep them apart, thus preventing the pictures from rubbing one against the other. The case can be turned either way, so that a picture may be brought back at once without going all through. The pictures being locked up when being viewed it is evident they cannot be soiled or stolen. The case can, if desired, be made air-tight; and the pictures are seen the same as they would appear in the ordinary frame with glass over them, two or more at a time. It will thus be seen that the new album is both ingenious and calculated to be useful. We have in our publishing-office a working model of this the latest addition to the world of pictorial photography, and which may be examined by those interested in such matters.

GELATINO-BROMIDE EMULSION.

The much-improved method of extracting the nitrate salt from the emulsion introduced by Mr. Wratten considerably lessens the time expended in its preparation, and it appears to me to be the only thing which was wanted to render the process complete. Indeed I am so pleased with the idea of doing away with dialysing or washing that I venture to communicate the result of a trial of the new method, also to show how I succeeded perfectly in preparing four ounces of highly-sensitive emulsion in about two and a-half hours, using only two ounces of methylated alcohol for the removal of the nitrate salt. This quantity of spirit, I believe, is about one-fourth of that recommended at page 385 of the Journal. The short space of time required, as well as the small amount of spirit used, will, perhaps, hardly be credited; but if you will permit me I will try to explain how this is.

In The British Journal Photographic Almanac for 1874, at page 135, is an article by Mr. W. B. Bolton—*How to Make a Gelatine Emulsion*—in which that gentleman speaks of the difficulty of forming bromide of silver in such a body of gelatine as twenty grains to an ounce of water. He recommends one grain and a-half or so during the time the emulsion is being formed, and, when the decomposition of the bromide and silver salts is somewhat near complete, to thicken up with gelatine to make the twenty grains. Since that time I have adopted this plan, or rather a modification of it, which is as follows:—

To make four ounces of gelatine emulsion:—Soak four grains of Cox's gelatine in four drachms of water in a four-ounce bottle. While the gelatine is soaking weigh out and dissolve thirty-six grains of potassium bromide in the same water. In another small bottle dissolve forty-eight or fifty grains (not more than fifty grains, or the plates will not keep) in four drachms of water. In about ten or fifteen minutes this fine-shredded sample of gelatine will have become thoroughly swollen. Cause it to dissolve by warming the bottle, after which allow it to cool down a little. Then take the bottles to the dark room, and pour the silver solution on to the thin bromised gelatine—a little at a time—giving the latter a good shaking after each addition, until all the silver has been added. If this operation be anything like carefully performed there will be little or no precipitation of bromide of silver at the bottom of the bottle, and it will be an intense and very smooth emulsion. The bottle should then be placed in a light-tight zinc case, the stopper loosely put into its place, and the whole placed in a saucepan of water and raised to the boiling temperature, and kept at that for five minutes. In this way the emulsion is driven to almost complete decomposition—in other words, to its highest sensitiveness. This heat cannot do any harm to the finished emulsion, as there are only four grains to be acted on while boiling. Allow the emulsion to cool again, and soak in it seventy-six grains more of gelatine. When sufficiently swollen dissolve by heat as before. The emulsion will now be very thick, and will only measure about one ounce. The two ounces (more or less) of alcohol can then be added in a few doses with shaking, and the gelatine and bromide of silver will be deposited at the bottom and about the sides of the bottle. In a few minutes more the liquid can be poured off which contains the nitrate salt. It is only necessary now to fill with water to four ounces, soak for an hour, and dissolve by warming and shaking. It dissolves quite easily after soaking properly. Wm. Aston.

N.B.—If Nelson's gelatine be used a much longer time will be required for soaking, as it is in much coarser shreds.—W. A.

NOTES ON PASSING EVENTS.*

By a Peripatetic Photographer.

It was Mr. John Hampden, if I recollect rightly, who once gave it as his opinion that the Editors of this Journal, along with other London editors, were, in some fashion or other, subsidised by an evil-disposed Government to write against the truth of the flat-earth theory held by that gentleman. I wonder how they would like it if I were to suggest that they are influenced in a similar manner by the Excise, seeing that in a recent article on methylated spirits they have most carefully guarded themselves against conveying any practical information of the best means by which methylated alcohol can be freed from its offensive odour. It is pretty well known that the Excise do not care that publicity be given to such information as that to which I allude, and, like our Editors in the article referred to, are fonder of speaking of "pains and penalties" than of technical experiments in such a direction. But is there any reason why *I* should not speak out freely? The Editors may have been "subsidised" by Government not to say a word respecting the truth of the absolute flatness of the earth, or by the department of Excise to beware of breathing a word that could possibly aid in attempts at making methylated spirits of wine potable by depriving it of its offensive smell; but as I cannot remember having received from the "authorities" a single penny piece by way of bribe, I shall be less reticent than they have been. There are two methods by which the unpleasant odour of methylic alcohol can be removed. The first consists in mixing with it a little water and allowing it to stand for a day, and then filtering it through nine or ten changes of pulverised animal charcoal which has been freshly burnt. After such treatment it emerges perfectly sweet and pleasant to the smell. By means of distillation it may be brought up to any desired degree of strength. The second method consists in pouring the spirit into a retort and dissolving in it a few shreds of soda soap. By applying heat and distilling it the smell is absorbed by the soap, and the spirit passes over in such a state of purity as to give no offence to the olfactory nerves.

To dialyse or not to dialyse—that seems now the question. As to whether it is better to employ emulsions *with* their soluble salts or elect means for their discharge there seems no room for doubt. But here arises occasion for confusing thought: whether is it better to wash, to dialyse, or to precipitate by alcohol, when making our emulsions? It is water *versus* spirit. Dialysis may be the most beautiful of the three methods when looked at from a scientific standpoint; still photographers look not so much at beauty of principle as facility of practice. But not yet having tried the latest expedient suggested for eliminating crystallisable salts from gelatine emulsions, I show my wisdom and consult my comfort by abstaining from instituting a comparison. This thought reminds me that one of your correspondents, "E. D.," has not acted with that wisdom characteristic of another writer, whose initials are similar, in proclaiming to the world his sentiments on this matter after having made one solitary trial. Josh. Gilpin, in a similar manner, unhesitatingly condemned the wet collodion process because he did not succeed the first time he tried it. *Verb. sap.*

May one cause of the not overabundance of visitors at the late meeting of the British Association at Plymouth be found in the great difficulty shadowed forth some days before the meeting respecting the difficulty of procuring accommodation? Rumours of seventeen shillings a day for lodgings are not unknown to some of those who were bold enough to venture into Plymouth after all the lodgings under the control of the local committee had been disposed of. The obtaining of apartments in any town in which the Association meets has long been a *vexata questio*, and in my estimation it is one that could easily be got over by the local committee undertaking to secure lodgings for those who a week previous to the meeting shall have signified their intention of being present and authorise them to procure the requisite accommodation.

Carbon printing by single transfer is now being forced into notice, and it is rather a wonder that it has ever been allowed to slip out of sight to such an extent—I mean for small work. For enlargements I suppose no other process ever is or has been worked. There is one thing in favour of single transfer—no patents intervene to prevent its being practised, if we except that which relates to the manufacture of tissue, which patent has still a few months to run. Every firm, as well as every man, is presumed to know its own business best; but if I were adviser-in-chief to the Autotype Company (which company must, and I hope will ever, be looked up to as the great regulators of the carbon printing business in this country), I would say to them—Place every facility in the way of the universal adoption of carbon printing by photographers, and don't, as far as you possibly can, grant the invidious thing known as an *exclusive* license, or create licensees of any kind, and depend upon it the photographic public will rally round you. I admit *in toto* the validity of your double transfer patents, I admit that you have a right to recoup yourselves for your outlay and your enterprise in securing that and other patents; but for the sake of carbon printing and its general adoption, and bearing in mind the blind antagonism shown by the British photographer to everything connected with patent rights, I would ask you to consider if it would not be expedient to throw the whole system of carbon printing open to the world. I once more assert my belief in the soundness of the double transfer patent, and do not base this appeal upon right, but expediency. The Autotype Company have an undoubted right to their own patents, and as business men they naturally desire to secure the largest income as the result of their doubtless large expenditure; but it is my belief, although I may be wrong, that if at this juncture they act with the greatest possible amount of liberality in this matter the public will rally round them, and show that commercial generosity is appreciated.

(To be continued.)

EMULSION NOTES.

In speaking of the relation of fineness of division to sensitiveness in bromide emulsions the Editors of this Journal have said (in effect) that the cause of a fine emulsion being slower than a granular one is not apparent. Is not the following an explanation? A fine emulsion is of a deep orange colour by white light, and does not this colour act in the same way as a stain in the film, which is a well-known retarder to the action of light? This seems to me to account both for the inferior sensitiveness of finely-divided bromide of silver and for the freedom from halation which such films enjoy.

The "Peripatetic Photographer" asks for something less "rub-off-ative" than tallow for edging plates previous to development. I have used paraffine for this purpose, and in my hands it leaves nothing to be desired when edging is necessary; but latterly I have not had any trouble by films slipping off. I use a very weak substratum of albumen—one to a hundred—and after coating my plates I dry by heat; in fact, they receive a good baking, being heated almost as hot as the hand will bear without pain.

I hope I shall be pardoned for saying a word or two on spots. I think they arise from at least two distinct causes. Some are, without doubt, in the emulsion when poured on the plate; these are mostly seen as transparent holes in the film after development. But there is quite another kind of spot showing itself as an area of inferior sensitiveness, which increases in size by keeping, sometimes covering the area of two or three square inches. These are caused, seemingly, by some kind of foreign matter falling on the plate before or after coating with emulsion, and may not show at all if the plate be developed within four or five days.

I have succeeded in avoiding the first variety by allowing the emulsion to settle and afterwards decanting and using that part free from the coarser particles. The only way of avoiding the second kind is to use the plates as soon as possible after their preparation. But it is very unpleasant to think that one's plates will not keep.

Philadelphia, August 23, 1877. D. A. PARTRIDGE.

THE ART OF PAINTING UPON THE PHOTOGRAPHIC IMAGE.

No. II.

IN resuming my instructions for finishing in black and white, let me urge upon the student to do as much as possible without stippling or niggling. Let him get all the effect he can by washes and broad touches, and in finishing or sharpening up the drapery to avoid lines as much as possible, making the shadows define everything. Even round the lapel of a coat, for instance (where an amateur is so apt to indulge in a line), it can be done more artistically, and, if you examine the photograph, you will be convinced more naturally too, by a series of long, acute-angled shadows. Consider the direction of the lighting, also, in every detail. Nothing looks so bad as to see a black line running all round a button, for instance, instead of a shadow at one side and a light at the other. Again: avoid marking out such things as the plaits in a shirt front with black lines on *both* sides of the plait; they should be soft, broken lines of shadow on one side and touches of white on the light side. These may seem small matters, but no amount of the most beautiful stippling will ever produce a picture pleasing to the educated eye if such matters be neglected or badly done.

As regards stippling: remember it is a means to an end, and not the end itself. The absolute beginner had better practice upon note-paper at first. Let him make a number of square washes of colour—some light, some dark, some flat all over, and some graduated from light to dark—horizontally and perpendicularly, using sepia for this exercise. Taking a fine-pointed sable brush, let him dip it in a moderately-fluid, faint tint of sepia, and try to fill up all the inequalities, fitting the light parts with tints that will match the surrounding parts—first with large touches, and then with gradually smaller and smaller touches until the whole is quite even and regular. The result of trying to do this will be most discouraging at first—the beginner will seem to get the patch more uneven than before; but there is nothing for it but perseverance, and he will find himself suddenly slip into a method of his own. When he can manage with simple sepia on note-paper, let him mix a tint of burnt carmine (which is recommended as being permanent) with ivory black and gum water, so as to match in tone and gloss the face of the photograph—that is, if it be an autotype or albumenised silver print; if a plain paper one omit the gum, as gum should not, I think, be used in the latter, except a few finishing touches about the eyes, corners of the mouth, nostrils, &c.

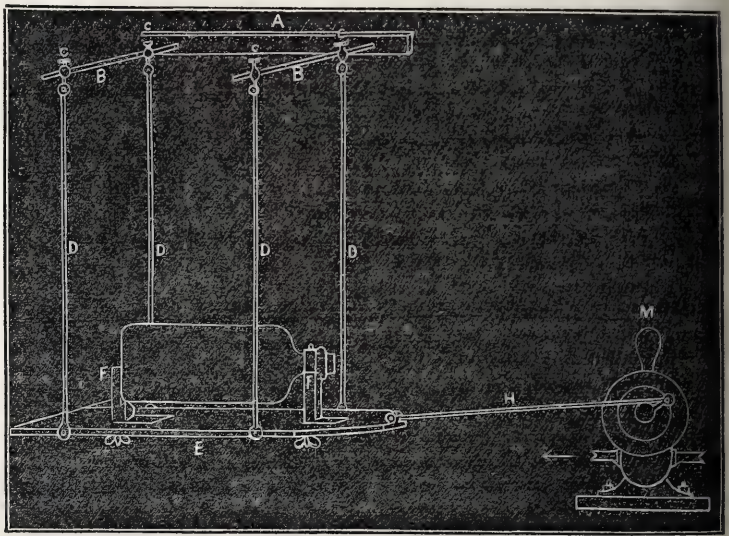
Now let him carry his experience of stippling on to a face, and try to fill in all the little uneven patches and holes, strictly preserving, however, the lights and shades and markings of the muscles. The object is not to fill up all depressions and wrinkles, but simply to furnish a pleasing regularity of grain, so to speak, to the shadows already there. Still there are cases where muscles may be contracted so as to give an angry or pained expression to a face undergoing the, to many, painful experience of being "taken." Perpendicular creases between the eyebrows may generally be filled up with advantage, and the pained look caused by the eyebrows being pulled upwards at the extremities next to the nose may be obviated by simply cutting a little off, and restoring the arch of the eyebrow as it is when at rest. A too strong dark line running from the corner of the mouth downwards should be softened and lightened, and the corner of the mouth turned up a little if anything; also, if the line running from the nose to the mouth be very black it should be modified. The whole of the space between the upper lip and the nose will often be found to be too white, and the addition of a half-tone carried all over it often acts like a charm in removing a sulky expression.

The student may next take his note-paper and try his hand at cross-hatching. He should carry a light wash of sepia all over half-a-sheet of note-paper, then fill it up here and there where requisite to make it tolerably even, and, when quite dry, let him proceed to cross it all over with broad, short lines—first in one direction and then across—taking particular care to let the lines cross at as acute an angle as possible; anything approaching a right angle is bad. Let him examine good engravings and see how it is managed there. If well done the effect is valuable and pleasing in backgrounds. If it be thought desirable to have the effect very fine and close, a kind of triangular touch may be placed in each lozenge-shaped aperture formed by the crossing of the lines. When this cross-hatching is used behind a head I think it best to treat it in this manner near the face and head, leaving it coarser and more open as you get near the corners of the picture. It will be found that this has the effect of throwing back the ground behind the head, and preventing confusion to the eye. JOSEPH WAKE.

ON MIXING EMULSIONS.

I HAVE for some time past been occupied in experimenting on a means whereby emulsions can be made in large quantities, and at the same time getting a perfect division of the nitrate of silver.

The agitation of the emulsion does not present any difficulty when made in small quantities; but when manufactured on a large scale it is inconvenient to obtain the necessary agitation. In order to remedy this I have had recourse to a mechanical contrivance constructed by M. Aloerginat, and of which the following is a description:—



A is a bar of iron which is fastened to a wall, and from which projects two brackets, B B, and on each of these arms are rings, C C C C. From the rings are suspended four rods, D, terminated at each end by a ring or hook. These rods support the platform, E, on which the bottle containing the solution is placed. F F are supports for said bottle. The whole should be so arranged as to swing easily.

The oscillating movement is obtained by means of a small hydraulic motor used for sewing machines, and which need not possess any great power. The motor is connected by means of H. A very slight degree of force is sufficient to oscillate a great quantity of emulsion when once it has been set in motion. I have under these conditions made a large quantity of emulsion, the results of which have been highly satisfactory.

I may say, after what has been published by M. Andra, that I have introduced without precaution the bromised collodion in the hot alcoholic solution of nitrate of silver, without troubling myself about the precipitate.

The precipitation of emulsion with hot water is very easy; but I hink it ought to be remarked that the precipitate should be submitted to slight pressure. It intensifies its effect, but very good esults have been obtained when the emulsion has simply been drained and dried.

In order to render the desiccation more rapid, and at the same time more complete, I dry the precipitate in blotting-paper, and introduce t under a bell-glass, together with a dish containing some concentrated sulphuric acid, and make a vacuum. The product resulting from this operation is flaky, but it dissolves readily in alcohol and ether, and furnishes a fine film free from defects.

The emulsion should be introduced whilst wet into a dish containing alcohol (forty degrees), and in a few hours place again in concentrated alcohol. This second bath serves to remove all traces of water. It should then be dried as before, and the emulsion ought to be dissolved in the ethero-alcoholic mixture. If it be preferred that the emulsion should be kept in powder it is dried rapidly, and can easily be redissolved.

In conclusion: I must say that during the recent hot weather I have modified the proportions of alcohol and ether indicated for emulsions. I use sixty per cent. of alcohol and forty per cent. of ether. This modification I found necessary. C. Bardy.

—*Bulletin de la Société Française de Photographie.*

PHOTOGRAPHY AND THE FLOOD.

The influence of the various rivers and streams that flow through a country on the geographical distribution of cities, towns, and villages is well known, and their value, both as a motive power and means of transit as well as in many other directions, cannot easily be overrated, although those who either from choice or necessity fix their places of abode or business premises in their immediate vicinity have occasionally to pay an unpleasant penalty. An unfortunate instance of this kind has occurred to myself within the last few days, the details of which may interest some of the readers of the Journal, and serve as a warning to others. Warriston Crescent, in the centre of which I have been for some time located, is part of one of the northern suburbs of Edinburgh, having an open park in front and gardens behind which slope down to within a few feet of the bed of the Water of Leith—a placid, although hardly pellucid, stream having its rise in the Pentlands, and where it passes the Crescent being little more than knee deep under ordinary circumstances. The Crescent gardens are bounded by a strong retaining wall fully fifteen feet from the usual bed of the river, and divided by walls of lighter construction at right angles to the houses; and, although the water had often during a spate risen much above the level of the ground, no danger was ever apprehended, the retaining wall having hitherto proved quite strong enough to withstand any pressure that had been brought to bear upon it. The recent heavy and continuous rain so general all over the country would seem to have been particularly abundant on the Pentland range, and in consequence the water rose in spate higher than on any former occasion, culminating on the night of Monday, the 20th ult., in the complete wreck of the gardens and destruction of nearly everything contained in the under flats of the houses. Towards the evening of that day the water was observed to be higher than its usual spate mark—in fact up to nearly the top of the wall; but it merely excited some little curiosity and no apprehension, and the inhabitants generally retired to rest little dreaming of the "rousing" that awaited them.

At a few minutes past eleven o'clock I was startled by a crash which I at first supposed was the explosion of a locomotive on a line of rails situated at a distance of a few hundred yards; but a sound of rushing water made me run to the window, and in the semi-darkness I saw that a breach had been made in the retaining wall opposite the third house to the west of mine. Here the torrent was rushing and foaming in and rapidly filling up the space between the right and left boundary walls like the lock on a canal. Higher and higher it rose till within a short distance of the top, when with a crash the boundary wall gave way and the garden next to it shared the fate of its neighbour. In this manner wall after wall gave way till from end to end they were thrown down, and everything contained in the gardens was completely wrecked.

In my own garden I had, some two years ago, erected for experimental purposes a substantially-built glass house 25 × 10 feet, and it contained, in addition to some of the usual studio appliances, several cameras and valuable lenses; and although I watched wall after wall give way, and garden after garden submerged, I was powerless to make any attempt to save the contents of my glass house. As the torrent rushed into and filled up No. 15—the garden next to mine—it was watched by me with breathless interest during the few seconds that elapsed while the wall resisted the pressure; but down came the latter, too, and almost simultaneously the noise of rushing water made itself heard from the inside of the house, the force having broken open both front and back doors, and the water risen to over three feet in the whole of the under flat. At the same moment the ponderous glass house was bodily lifted from the brick piers on which it rested, and floated away, ark-like, down the garden, till it became jammed between a tree and some of the massive stones of the prostrate wall.

Some idea of the force of the current may be formed from the fact that the stones of the wall (some of them of large size) did not lie where they fell, but were scattered all over the ground. One of these stones I have just measured, as it lies where it fell, or rather in the position to which it was carried—a distance of thirty-nine feet—and find it is 2 feet 8 × 14 × 9 inches. Towards midnight the river began to subside, and in the course of the following day we managed to collect the miscellaneous property that had all night been tossed about in the various apartments and passages of the house, and a woeful plight they were in. My laboratory was in the unfortunate under flat, and on a rack there had been arranged the accumulation of over twenty years in the shape of cameras, lenses, printing-frames, negatives, boxes of dry plates, and the thousand-and-one things photographic that a tolerably constant experimentalist gathers about him. The two lower shelves of that rack were completely cleared out and converted into the most unclean mass of mud and dirt that one can conceive.

Nor did the contents of the glass house fare any better. As soon as the water subsided so as to be fordable it was entered, and the interior presented a miserable spectacle. All its contents had been floating about in one confused jumble, and everything destructible was destroyed so far as mud and water could do it. I felt as if it would be a relief were somebody to bring a cart and remove the mass for ever out of my sight.

When the water had completely subsided, the whole of the photographic *matériel* was huddled into the glass house—of which, strange to say, not a pane had been broken—and I have not since had either the leisure or the courage to look at it. How far it will be possible to repair the damage, or what the ultimate loss will be, I do not at present know; but of one thing I am certain, and that is, that in future I shall not willingly reside in a house that is not perfectly free from the danger of being inundated by the highest possible spate. John Nicol, Ph.D.

PHOTOGRAPHY AT THE WAR.

Not feeling well after my flight from my enemies, the Bashi-Bazouks, I made my way home to Pera. I found that I had not only lost my money, but they had also taken my watch and kindly left me the key. I think I failed in politeness in not handing the latter to them.

Next, nothing daunted, I went to the Minister of the Interior and asked for my photographic apparatus. By dint of some "tips" I at last got to hear of them, and I was overjoyed to find them safe. From an official who spoke our mother tongue I received a caution and was allowed to take my apparatus with me. The "caution" referred to the permission I should have obtained before commencing photographing. I explained that I had now got the requisite permission, which applied to Asia Minor only. Being armed with this I sallied forth for another day's work.

Crossing the bridge at Stamboul I met my old friends, the beggars, who never allow one to pass them without importuning for alms. By-the-bye, these men, women, and children, who are deformed in every conceivable way, would make a fine series of photographs which would be invaluable to the College of Surgeons. Such withered arms, withered legs, and living skeletons I hope it may never be my lot to look upon again. I endeavoured to induce some of these poor folks to allow me to photograph them, but they one and all refused. Insinuating my horse and myself through the varied crowd which populates this district, as I passed through the Greek and Jewish quarter I managed to induce some of the female beauties to place themselves in position for a group; but here I had reckoned without my host, for the tramway cars passing and repassing, and the streets being exceedingly narrow, I had to shift my camera so frequently and squeeze myself so close to the wall that I gave up this subject in despair. My fair friends crowded round me curious to know the result; so I had to resort to that expedient which is practised in England when a sitter arrives late in the day and insists upon having his portrait taken—that if the picture should not be satisfactory I would come again. With this they were anything but contented; they evidently expected to see their portraits at once. By the aid of bows and compliments I managed to get clear; but the youths of this quarter were under the impression I had been doing something wicked, and gave me the same salute I met with on my first day's journey, namely, a shower of mud, &c.

I next directed my steps to the Mosque of the Sacred Pigeons, which is situated at a considerable elevation above the shores of the Golden Horn and on the Adrianople road. Of this picturesque building I much wished to secure a view, both interior and exterior; but upon consulting the keeper he required so much money to allow me to photograph the interior that I declined with thanks. This worthy old man invited me inside, and here I made good use of my time by making a sketch while his back was turned attending to his birds. These birds represent, I should imagine, every variety of the pigeon tribe, some of them being the most beautiful creatures conceivable. This mosque is a square building of stone, without windows on the exterior and scarcely any ornamentation. The interior is roofless, with the exception of a corridor running round the four sides. A fine old tree occupies the centre, and at the base is a fountain. These pigeons are lodged in holes made in the wall, and are constantly flying in and out in large numbers; but they never by any chance leave the mosque. Being very hungry about this time, the impious thought came into my head that a few of these pigeons made into a pie would not be at all bad; but it is as well to keep one's thoughts to himself in this part of the world.

It being now long past midday, and the sky having an ominous appearance, I rode towards the shore which faces Scutari. Here I parted with my horse and took to the sea; but before I reached the other side I came in for rather more than I had bargained for, in the shape of a thunderstorm, and I found that a thunderstorm on the Bosphorus in a small boat is anything but a joke. We had only got about half-way across when it commenced to rain, followed by a terrific fall of hail. I would rather not mention the size of the hailstones for fear of seeming to exaggerate. Every one may know what Spanish nuts are, and as I am blessed with a prominent nose the hail found it out. Besides this, we were dancing about on the waves like a cork, the boatman having lost entire control over his boat. We gave up all hope of ever reaching the other side, and had to board a passing steamer, and once more myself and apparatus were safely landed at Stamboul bridge. EDWARD POCOCK.

EMULSION MANIPULATIONS.

ALTHOUGH so much has been said and written on the mode of developing and the general manipulation in the production of an emulsion negative, there still appears to be a call for light, and from some quarters this cry is fierce and sharp. The fact appears to be overlooked by some that by making a conspicuous display of their failures they put themselves in strong and unfavourable contrast with those who succeed, and to a great extent justify adverse criticism as to their intellectual capacity.

To avoid the necessity of answering some correspondent almost every day, I will give in minute detail my mode of manipulation in producing an emulsion negative.

First, prepare the plate either with albumen or talc. If with albumen, prepare it as follows:—White of one egg dissolved in eight ounces of water; after the solution is complete add eight ounces of water, to which has been added sixteen drops of carbolic acid. Ammonia in the albumen should be avoided. If talc be used, clean the plates with undiluted sulphuric acid; wash well, and wipe dry with a clean cloth which has been washed in water containing washing soda instead of soap, and when dry apply the talc. If the plate is to be exposed and developed while wet place it in clean water as soon as the film has set, and let it remain until the greasy lines are washed off (after this is accomplished it will not be injured if it remain in the water for a week). Expose, and before developing flood the surface with water in order that the developer may go smoothly over the surface. A quantity of the soda solution sufficient to cover the plate is poured into a wide-mouthed vial, and just before using a few grains of pyrogallic acid are put into it, which dissolves in a few seconds by agitating the soda; then flow over the plate. The flowing of the plate with the developer can be done moderately, as nothing is gained by dashing it on, as many do the iron developer in developing a bath negative. If the plate has been over-exposed the appearance of the negative on the application of the developer will be the same as that of a bath plate.

I would advise anyone commencing the use of emulsion to expose one or more plates in this way:—Prepare a plate, and give it three exposures by drawing the slide so as to expose one-third of the plate, and after ten seconds draw it so as to expose two-thirds of the plate, and give this ten seconds; then draw the slide so as to expose the whole plate, and give this ten seconds. In this way the first part of the plate gets thirty seconds, the middle part twenty seconds, and the last ten seconds. By developing a plate so exposed you can approximate very near the proper time for the light you are working in.

The great variation in the actinic force of light in different localities is a fact, to a great extent, overlooked by photographers. The light from the rear windows of my residence is at least twice as strong in actinic force as that in the Central Park, three-quarters of a mile away. Before going to the park to expose plates I always expose a small plate from my window at the rear of my house, and if fifteen seconds makes a good negative I invariably give from thirty to forty seconds in the park. The most striking illustration, however, of the difference in different localities of the actinic force of light I observed in making negatives at Niagara Falls. Plates which required thirty seconds' exposure in New York were fully exposed at the Falls in from three to six seconds.

From these facts it will be observed that when one attempts to state definitely how much exposure should be given for a specific quality of emulsion the chances are that he would only mislead; for this reason it becomes necessary to expose a plate as above directed, and thus determine the action of light in which the emulsion is exposed.

If the plates are to be used dry the process of development is the same. The plate should be thoroughly washed before applying the developer. I usually, however, flow the plate after washing with a pyrogallic acid solution from three to six grains strong, until the faint outlines of the image appear. This pyro. solution can be used repeatedly for several hours.

I determine in this way whether the exposure has been long or short. If the image comes out quickly and has a reddish appearance it indicates an over-exposure. I then reduce my soda solution by adding a small quantity of water—in the first place one-fourth—and determine by its action how to treat the next plate.

Some failures to get good negatives from emulsion have been caused by washing the plates in water unfit for the purpose. Organic is less objectionable than mineral substances in the water. Water from melted ice is always good for this purpose.

The greater the quantity of pyrogallic acid used the more intense will be the negative. There is, of course, a limit to this effect of pyro. If the negative, after fixing, needs strengthening, use the iron and citric acid as follows:—

No. 1.

Water	16 ounces.
Protosulphate of iron	1 ounce.
Citric acid	½ „

No. 2.

Water	1 ounce.
Silver	20 grains.
Nitric acid	6 drops.

Pyro. and citric acid can be used, but are more likely to produce stains, and in my hands are not so satisfactory as the iron.

—*Photographic Times.* H. J. NEWTON.

ON THE THEORY AND PRACTICE OF LEAD INTENSIFICATION.—A REPLY TO PROFESSOR WARTHA.[*]

I FOUND that after standing twenty-four hours at an ordinary temperature with either dilute sulphuric acid or muriatic acid, ferrocyanide and ferricyanide of lead were both decomposed by the giving off respectively of hydric-ferrocyanide and hydric-ferricyanide, while the corresponding silver compounds were not attacked by the sulphuric acid, though they were decomposed by the muriatic acid. By this property a way is found for the separation of the lead from the silver-iron cyanides.[†] If one pour dilute sulphuric acid upon the frequently-washed but still orange-yellow precipitate obtained by the action of silver upon ferricyanide of lead, it soon becomes whitish, which is again an indication of the presence of ferricyanide of *lead*, and not of ferricyanide of *silver*.

For the quantitative analysis of the product of the reaction I treated 0·8224 grammes of it with dilute sulphuric acid, and twenty-four hours afterwards I filtered it off. I diluted the filtrate until it bulked 200 c.c., 100 c.c. of which I immediately mixed with chameleon[*], 1 c.c. of which =0·0122 of a gramme of crystallised prussiate answered =0·0061 of a gramme of $Fe. Cy_6$. This treatment gave me information as to the lead combined with the ferrocyanide. I used 16·2 c.c., which corresponded to 24·14 per cent. of $Fe\ Cy_6$ in the original substance; the other half was reduced with a sodium-amalgam[†] in an alkaline solution, after which I used, after acidification, 16·5 c.c. of the chameleon solution. The use of this additional quantity gave evidence of a small portion of ferricyanide combined with lead, and the whole ferricyanide of lead contents of the precipitate I reckoned at 0·66 per cent.

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[*] Concluded from page 416.

[†] The complete practical proof of this statement and the following I shall shortly publish in a chemical journal.

The residue from the digestion with sulphuric acid was treated with dilute muriatic acid, the filtrate again divided into two equal halves, and the ferrocyanide and ferricyanide determined as before. I used, however, for the reduced half the same quantity of chameleon as for the unreduced half, viz., 2·0 cubic centimetres, which answered to 2·96 per cent. of $Fe.\ Cy_6$. From this it is evident that in the product of the reaction of silver upon ferricyanide of lead *there is not a trace of ferricyanide of silver to be found,* with which fact Professor Wartha's analytical equation loses every hold. But the ferrocyanide of silver present has become partly decomposed, which explains why I did not find the theoretical quantity. The determination of the lead and silver was gone about, according to the directions of Fresenius and Haidlen,[‡] with cyanide of potassium and carbonate of soda. The silver held in solution was precipitated with sulphide of ammonium, and recovered as a metal by making it red hot in a current of hydrogen, as directed by H. Rose.[§] The carbonate of lead remaining on the filter was dissolved in dilute nitric acid, thrown down as sulphide of lead, and as such recovered after heating in the stream of hydrogen. The filter was then reduced to ashes, saturated with nitric acid, and the remaining traces of lead likewise thrown down as sulphide of lead, and added to the quantity previously got. From the quantity of silver = 0·0904 of a gramme, and of sulphide of lead = 0·2933 of a gramme, found in 0.5166 of a gramme of the product of the reaction, the following figures are got:—

	Found.	Computed according to my equation.	Computed according to Professor Wartha's equation.
$4\ Ag$	17·50	17·12	13·42
$Fe\ Cy_6$	—	8·41	8·78
$6\ Pb$	49·56	49·25	51·45
$3\ Fe\ Cy_6$	24·14	25·22	26·35
		100 : 00	100 : 00

N.B.—The $Fe\ Cy_6$ bracketed with the silver is to be considered as forming a compound with the silver; that under the lead as forming a compound with the lead.

From this analysis it follows that the product of the reaction of ferricyanide of lead upon silver consists of ferrocyanide of silver and ferrocyanide of lead; that it contains *no* ferricyanide of silver; that the equation I gave before correctly represents the decomposition; and that it may be shortly written thus:—

$$2\ Pb_3\ Fe_2\ Cy_{12} + 4\ Ag = 3\ Pb_2\ Fe\ Cy_6 + Ag_4\ Fe\ Cy_6.$$

Professor Wartha may not have used the pure product of the reaction for his experiments, but one largely adulterated with ferricyanide of lead, whence the possibility of reduction determined by hyposulphite of soda and zinc, while the additional weight required by his calculation is dependent upon the admixture of ferricyanide of lead, by means of which his weights happily tally with his formula.

With regard to Professor Wartha's other assertion—that intensification with lead must always be carried on in the dark—I did not at first intend to say anything, as everyone who has had practical experience of intensification with lead will have convinced himself of its incorrectness. I shall not assert that Professor Wartha found it so very "self-evident" that one must intensify in the dark room that he entirely omitted all experiments in this direction; but he has certainly let out the fact that ferricyanide of lead solutions, when exposed to light, will in time become turbid, misleading him to the conclusion that this turbidness appears quickly enough and powerfully enough to produce fogging, without having sufficiently tested his opinion by practical experiments.[‖] Also, Captain Tóth and I were well aware of the sensitiveness to light of a solution of ferricyanide of potassium and nitrate of lead, as we showed in a former article; and when, in spite of that, in publishing our method we recommended that the work should be done in daylight, it was because we had previously convinced ourselves by many experiments of the harmlessness of the light to the lead intensification process. I still hold to the correctness of the assertion that one should intensify by daylight.

I am also in a position to strengthen this opinion by the authority of Professor Vogel, of Berlin. In a private letter he says that even when intensifying in the sunshine there was no fogging. He remarked no fogging even in spite of a quarter of an hour's sunning, and in spite of the perceptible turbidness of the lead solution caused by the action of the sunlight. Professor Vogel shows that if the layer of the bath be half a centimetre thick a decomposition of the plate itself is not so much to be thought of as that the chemically-actinic light will be excessively weakened by passing through the solution of the ferricyanide of potassium. He determined the degree of this weakening by Vierordt's method, with the spectral apparatus, and in the region $F \frac{1}{3} G$: with a solution of one to one hundred and sixty it yielded a decrease of 0·18. Now, if the solution used for intensification were ten times as strong, it would follow that the decrease of the power of the light caused by a solution one centimetre deep would be 0·0,000,000,357, the original strength of a ray of light being reckoned as one. Supposing the solution to be half-a-centimetre in depth and one to sixteen of ferricyanide of potassium in strength, the decrease of the strength of the light would be equal to 0·000,188. Under these circumstances only rays of light of very uncommon intensity could produce any effect, and a disadvantageous action of ordinary daylight when the plate is covered with a sufficient quantity of solution is more than doubtful, even from a theoretical point of view. In Professor Vogel's photographic school in Berlin it is the custom to "lead" always under a roof light through which the full light of day shines, and there the action of the light has *never* produced fogging.

I have convinced myself, by quite recent experiments in clear daylight, that light never—neither when the negative is in the bath containing the intensifying fluid nor when the solution is poured on—causes veiling of the negative. Therefore, I must retort by contradicting Professor Wartha's assertion that the methods of intensification published by Captain Tóth and myself shun the light.

In conclusion: I may remark that the chemical experiments referred to in this paper were conducted in the laboratory of Professor Pohl, in the Technical High School at Vienna.

—*Photographische Correspondenz.* J. M. EDER, M.D.

THE PHOTOGRAPHIC ARTISTS' CO-OPERATIVE SUPPLY ASSOCIATION, LIMITED.

FROM a printed circular forwarded to us we find a proposal is made to form an association under the above designation, and to incorporate with it the firm of Messrs. Chambers and Company and the Uranium Dry-Plate Company. The capital is to be £50,000, in 5,000 share of £10 each. Among the directors the name of Captain Herbert Kerr, of Chambers and Company, 251, Goswell-road, appears as *Managing Director*. Those of the others are not familiar to photographers. The nature and scope of the proposed association will be understood from the following "prospectus"—for the literary composition of which *we* are not responsible:—

"THIS Association has been formed to supply a want long felt among photographic artists by the establishment of a depôt on a large scale, and in a central part of London, for the exhibition and sale, upon *co-operative* principles, of every kind of article in use by photographers, or requisite to the art and practice of photography, and to manufacture such special articles incidental to photography, as may be deemed expedient for the supply of the depôt.

"Photography has so largely increased of late years, and now embraces numerous and varied branches and departments of work. In each of these are employed and consumed so many different articles and apparatus, that to conveniently acquire and maintain their equipment at a moderate cost has become a matter of considerable difficulty and importance to photographers, much of whose time is now taken up in selecting goods at various retail markets where articles are sold at prices much higher than those of the manufacturer.

"The tendency of this Association, conducted strictly on co-operative principles, will be to obviate all such obstructions to the trade and science of photography, and to bring the consumer into direct relations with the manufacturer. Its system is to manufacture, or purchase direct from the manufacturer on the most advantageous wholesale terms, selling again at the lowest possible increase of price compatible with the conduct of business, and a return to the capitalist first, of interest at five per cent. on his investment, and, after forming a judicious reserve against contingencies, *to divide all further profits*

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[*] According to De Haen, *Annal. Chem. Pharm.* 90, page 160.

[†] This excellent method was first published by Gintl, Fresenius, *Zeitschr, f. Analyt. Chem.* 6, 447.

[‡] *Annal. de. Chem. in. Pharm.*, 43, page 129.

[§] *Poggendorf's Annalen*, 110, page 139.

[‖] To Professor Wartha's opinion—that the reaction may be controlled by occasional observations of the progress of the intensification made from time to time by daylight—I shall only remark that this would only be done in a very few cases, as the process goes on so rapidly that there would be no time to run out and in to the dark room, and that to watch over the intensification in this way is almost impossible.

equally with the purchasers from the Association, being ticket-holders, whose purchases exceed £20 for the year of division.

"The Association have arranged for the purchase from Messrs. Chambers and Company, 251, Goswell-road, of their business and manufactory of albumenised paper and the uranium dry plates for the sum of £2,000, the whole of which the vendors have agreed to take in fully paid-up shares. The Association have also arranged to purchase Messrs. Chambers and Company's stock-in-trade at a valuation to be paid in cash.

"The Association will continue the above-mentioned manufactures and the business hitherto carried on by the firm of Chambers and Company, well known in photographic circles as having conducted the same during several years in a manner highly satisfactory to a large connection, which will now form a nucleus for the business of the Association. Captain H. Kerr, who has hitherto been the managing partner in the firm of Messrs. Chambers and Company, will continue to superintend the manufactures as managing director of the Association.

"Albumenised paper, the silver printing paper of the photographer, being an article of universal use and current consumption in photography, the adjunct of such a manufacture to the general business of the Association will obviously be advantageous, and the same may be said of the uranium dry plates, the merits of which have become well known to dry-plate photographers since their introduction several years ago by the eminent photographer, Colonel Stuart Wortley, the object of these plates being to obviate the use of wet collodion and nitrate of silver in outdoor and tourists' photography, and to prevent the necessity for excessive impedimenta in field work. Their great value is admitted by all who have used them, and they are rapidly becoming a staple article of commerce.

"The inducements held out by the Association to its patrons, and its whole system being based on the soundest general principles of trade, lead its promoters to believe that every object of the Association will without difficulty be realised, and that the low prices (which the principle of quick cash transactions will enable the Association to adopt), will stimulate the progress of photography, and increase the trade of the manufacturers from whom the Association purchases, who will thus be freed from the incubus of bad or long-standing credits (induced by a superabundance of middle dealers), tending to high prices and stagnation of trade.

"It may also be remarked that this Association, being strictly of a special and technical character, neither interferes with nor is affected by the business of existing co-operative institutions. There will be no restriction upon the sale of goods to any purchasers, but the Association will open accounts in their books for the purpose of the division of profits only with the holders of annual tickets of 5s. each. All transactions are to be for cash, and for the convience of ticket-holders the Association will open deposit accounts. All goods purchased at the stores of the value of £2 and upwards will be delivered within the metropolitan postal district free. All chemicals supplied by this Association will be thoroughly analysed by competent persons previously to being taken into stock.

"The only contract entered into is one dated the 30th day of January, 1877, made between Herbert Kerr and Edward Mason, of the one part, and Crewe Alston, on behalf of the Association, of the other part, and which contract has been confirmed by the Articles of Association.

"A form of application for shares is enclosed. Every application must be accompanied by a deposit of £1 per share, to be paid to the Bankers or Secretary of the Association, which will be returned in full if no allotment be made."

Bearing in mind the extremely low prices at which photographic goods of a high quality are sold at present by the respective dealers and manufacturers, we are, the above prospectus notwithstanding, tempted to inquire in what respect photographers will be benefitted by the formation of such an association.

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THE USE OF THE DIAPHRAGM.

Whether it was necessary to go to the Greek for a word to be used in a business like ours, which does not require a classical education, is a question we will not at present discuss; suffice it to say the word "diaphragm" is from the Greek, and means a partition or division. In photographic instruments it is hardly appropriate; to be literally correct it should have been "a cutter off," "a hinderer," for which a shorter word could have been found in the same language.

Some time ago an old photographer in our hearing boasted that he could put a batch as large as a dime right in the centre of his lens and make a good negative—better than without it—and he claimed something extraordinary for his lens on this account. At first this appeared like idle boasting, but it was literally true. We were so puzzled that our coming grey hairs got to rubbing against each other, and by-and-by a solution of the problem was ground out. For the benefit of our young readers we give it as briefly as possible.

A photographic camera tube for portraiture is composed of four lenses mounted in pairs—a pair in front hermetically sealed together, and a pair behind fitted to each other, but separated by a ring differing in thickness according to the size of the lens and the curvature adopted by the maker. Between these pairs of lenses the diaphragm is placed.

Few photographers study the philosophy of either the process they practice or the instruments they use. "Chromatic aberration" and "spherical aberration" are terms they have seen in the books and journals, but beyond this their knowledge does not extend; and if by chance one posted a little better happens to mention such a term, he is at once set down as "hifalutin" and anxious to show off, in the style of the coloured missionary who but yesterday was a wood-sawyer.

To render the subject intelligible, we will illustrate by an exaggeration. We will suppose a photographic lens to be four inches diameter and ten inches focus, with a spherical aberration of one inch. Now, as the aberration increases towards the edge of the lens, it is evident that if we cut half an inch all around, leaving an aperture of three inches, we have got rid of more than one-fourth of the aberration; but for the sake of simplifying we will suppose it to be one-fourth, and divide the lens into four divisions, which we will number 1, 2, 3, 4. No. 1 is the central inch, a circle of one inch in diameter. No. 2 is a ring half an inch wide and two inches in diameter. No. 3 is a ring half an inch wide and three inches in diameter. No. 4 is the outer half inch of the lens. The aberration we will also divide into fourths, and number 1, 2, 3, 4. No. 1 will represent that portion belonging to No. 1 division of the lens, and situated from ten and a-quarter to ten and a-half inches from the lens. No. 2 will be immediately in front of No. 1, by which we mean nearer the lens, and will extend from ten to ten and a-quarter inches. No. 3, following No. 2, will occupy from nine and three-fourths to ten inches; while No. 4, being nearest the lens, will extend from nine and a-half to nine and three-fourths. The open lens being ten inches focus, it will thus appear that the longest division, or No. 1, including only the central rays which pass nearly straight through, extends half an inch beyond the common focus; while No. 4, which includes only the outer rim of the lens, falls short by half an inch, as before stated. This is not absolutely correct, and is used merely as an illustration to explain what would be very difficult to explain accurately even by the aid of diagrams, and is utterly impossible without them. Of course every photographer knows that each atom of surface on his lens transmits a picture of whatever is before it, and the aggregation of these atomic pictures forms the picture seen on the focussing-glass of his camera. He also knows that the aberration referred to, and which requires the diaphragm to correct it, is caused by the light rays striking the curved surface of his lens at different angles, increasing toward the edge, and that the greater the angle the greater the refraction. In the case we have, suppose, for illustration, the difference is set down at one inch. Now, let us suppose our old photographer to have used the four-inch lens we are speaking of, and to have covered up the central inch; he then had divisions 2, 3, and 4 with a spherical aberration reduced from one to three-fourths of an inch. The lens would work slower but sharper, and he would get a better picture than without the patch; increase the size to two inches, and the aberration being reduced to half an inch, there would be a further gain of sharpness but a loss of light, and of course the lens would work slower.

A writer in the *Mosaics* touched on this question and asserted that a disc perforated with holes answered almost the same purpose as a diaphragm, and he was puzzled thereby, and well he might be. A disc perforated as his was would certainly reduce the speed, but it would not in any way affect the spherical aberration, inasmuch as the centre of the lens and parts of the outer division being exposed the aberration would be the same; but as parts of the lens were covered up a proportionate loss of light and speed would be the result without in any way affecting the aberration. Now, as it is to get rid of the blurring and lack of sharpness that the open lens necessarily gives that a diaphragm is used, it is evident that by reducing the aperture of the diaphragm the aberration on the basis of our supposed case is proportionately reduced; but in actual practice it will be found that the proportion of aberration cut off is much greater at the edge of the lines than nearer the centre, consequently a diaphragm covering divisions 4 and 3 will cut off much more than half the spherical aberration, and as the use of very small diaphragms in portraiture is attained with such a loss of light as to render them inexpedient they are very seldom used. It might be asked—If it be true that a patch in the centre will answer the purpose of a diaphragm why not use it? We reply: it does not answer the same purpose, as the rays passing through the centre of the lens are less refractive, and consequently yield a better picture; but as some old photographers like occasionally to puzzle their younger brethren we have tried to show why a patch on the middle of the lens does not prevent its making a picture, as some parties think it would. We have heard a person assert that a patch on the centre of the lens would give a picture with a hole in the middle of it, and argue long and earnestly to sustain his assertion.

The position of the diaphragm is also a thing to be considered. The front lens catches rays reflected from the object, and transmits them in converging lines to the rear lens, which, catching them converging, increases the convergence by a second refraction; the placing of the diaphragm between the front and rear lenses of the portrait combination cuts off the outer rays of the front lens, and shuts off the outer part of the rear lens. A disc in front of the front lens the same size as the diaphragm placed between the lenses reduces the speed of the instrument much more, while the diaphragm between gives the better picture. The reason of this we may take up at a future time, our present object being merely to show why a diaphragm is needed, why a patch on the front lens does not prevent it making a picture, and why a perforated disc does not either prevent the lens from making a picture nor act the part of a diaphragm.—*Practical Photographer.*

ROYAL CORNWALL POLYTECHNIC EXHIBITION.

Photographic Department.

The Judges in the photographic department regret to observe a falling-off in regard to the number of exhibits this year. It may be attributed to the run of unfavourable weather that we have had in England for the past twelve months, which has been very much against landscape photography and all outdoor operations. But, at the same time, there is a very important feature in the present exhibition that must not be overlooked, which is the great skill displayed both as regards artistic feeling and perfect manipulation. This will, at all times, more than compensate for any falling-off in numbers. Some of the productions this year are truly marvellous and of the highest possible order in both the professional and amateur sections.

The first in the catalogue is a very large composition picture—*When the Day's Work is Done*, by Mr. H. P. Robinson, of Tunbridge Wells, being the finest we have ever seen exhibited by that gentleman. He has been awarded a first silver medal.

Messrs. Frith and Company, of Reigate, send some very charming productions of large size—about 20 × 18. The best is *Trinity Chapel, Canterbury Cathedral*, with the tomb of Henry IV., which contrasts very forcibly with the generality of interiors, even of a smaller size, being very heavy through under-exposure. This picture in particular is quite free from that fault. It is very soft and, at the same time, brilliant, and free from blemishes of any kind. To this picture has been awarded a first silver medal. Messrs. Frith and Company also send several others of subjects of local interest and Swiss scenery, which are very fine.

Mr. Reuben Mitchell has been awarded a first silver medal for a very clever artistic picture—*A Lancashire Mill Pool*, which is very soft and brilliant.

Mr. F. Palmer sends some good illustrations of Swiss scenery.

Mr. Edwin Forhead contributes some four pictures. The best is a study of plants and flowers. The remainder are landscape subjects possessing several good qualities.

Mr. J. Millman Brown contributes some very good studies. His best is the *Valley of Bonchurch, Isle of Wight*, for which he has been awarded a first bronze medal.

Mr. G. H. Dew sends some good pictures of Stoneleigh Deer Park. The subjects are well chosen but are somewhat over-toned, and do not do the negatives fair justice.

In the portrait department Mr. G. Nesbitt, of Bournemouth, exhibits a fine collection of portraits. A first silver medal has been awarded to him for No. 640, a portrait study.

Mr. W. Gillard received a first bronze medal for a study of a head.

Mr. B. Wyles sends several productions of which we cannot speak very highly, owing to the careless way in which certain manipulations have been conducted.

Mr. S. Fry exhibits three pictures (composition) the one of *The Taxidermist* being the best.

Mr. W. M. Harrison, of Falmouth, sends an enlargement of a group of children in carbon, which is very fine. To this has been awarded a special bronze medal.

Mr. Faulkner, of London, sends some of his well-known exquisite work. Owing to their late arrival they could not be entered for competition. which we very much regret. His *Dorothy* and *Simplicity* are perfect masterpieces of art.

The exhibits in the amateur department are far above the average. Mr. E. Brightman carries of the palm for his gems, views on the Lynn, which remind us of the work of that eminent amateur, Mr. Russell Manners Gordon, and we think they are equal, which is saying a great deal. A first silver medal has been awarded to Mr. Brightman.

Following very closely to the preceding are some productions of Mr. H. Manfield, of Northampton, and are but very little inferior to the last exhibitor. A first bronze medal has been awarded to No. 770, *In the Frome Glen.*

The productions this year of Mr. F. M. Brownrigg we do not think do him justice. We have seen work of his that we liked better.

Mr. F. Beasley, Jun., comes out very strong this year, which shows that he is a very painstaking worker. We have examples by him of several processes. His rendering of *Ivybridge, Devonshire* (No. 723), by the collodio-emulsion, is very fine, and has been awarded a first bronze medal.

We must not omit to notice the productions of Mr. J. D. Radcliffe. Although small they are by no means insignificant. *Going on an Errand* and *A Quiet Nook* are perfect little gems in their way.

Mr. H. M. White exhibits some work stated to be photo-ceramics. We fail to see what part photography has played in these productions, and, therefore, we withold our judgment.

[The judges in the photographic department are Messrs. W. Brooks, Carne, and Lanyon.]

Our Editorial Table.

Portraits of the Right Hon. W. E. Gladstone, M.P.

By W. Currey, Bolton.

In a fine series of four portraits of the Right Hon. W. E. Gladstone, M.P., and his son, Mr. W. H. Gladstone, M.P., we are afforded a peep behind the scenes in connection with the private life of this energetic statesman. To preserve his brain from being overtasked by the onerous duties of public life to which he has so long and so earnestly devoted himself, Mr. Gladstone, it is well known, indulges very frequently, if not almost daily, for a brief period of the year in the arduous physical exercise of tree-cutting, in the execution of which self-imposed task he is said to excel, and in which it is undoubted that he takes special personal pleasure. In the photographs before us Mr. Currey has taken the great statesman in the wood at Hawarden while in the act of sitting down for a moment's well-earned rest, for the aspect of the trunk of a huge tree, which he has been engaged in felling, and the plethora of chips scattered around, leave no doubt as to his diligence. In all the pictures he is represented in his shirt sleeves, his straw hat lying on the ground beside him; and the expression on the face is, in one of the photographs at least, perhaps the finest we have ever seen of this gentleman, an immense amount of latent power being apparent, ready to be displayed at a moment's notice. In two of the pictures the ex-premier is seen alone; in a third he is photographed in connection with his son, Mr. W. H. Gladstone, M.P., whose costume, mien, and surroundings also betoken him to have been busily occupied in the avocation of a woodman, he, like his father, being *sans* coat and waistcoat. The fourth photograph shows the younger gentleman *solus.*

In posing and photographing these distinguished subjects for camera pictures Mr. Currey has shown much skill, and these pictorial works, when published, cannot fail to find many admirers for various reasons, not the least being their non-conventionality.

Correspondence.

THE CONDITIONS OF SENSITIVENESS.

To the Editors.

Gentlemen,—I think you will be interested to hear that I have further evidence in favour of my theory for the cause of sensitiveness in the bromide plate.

Having had cause to boil down a strong silver bath I took the opportunity of making baths thereafter with it of various strengths, from twenty grains to eighty grains. The result varies with the collodion used; but, broadly speaking, with a bath of thirty grains and under the bromide is liable to burst out, this "bursting out" taking various forms, such as a reticulation, smears in the direction of the flow of the bath (a flat bath being used), wormlike marks, &c. A strength of bath that would be considered too strong for the ordinary wet process gives a thin, transparent plate, which is not altered by many hours' stay in the bath. Sixty grains seem to be the weakest that can be employed in practice—at anyrate with our present knowledge. Now, this is the point:—If a plate be sensitised in a very weak bath so that the bromide bursts out (I am especially able to speak as to the "reticulated" appearance) and another plate be sensitised in (say) a forty-grain bath and a third in an eighty-grain bath, each plate being left for the *same time* in their respective baths, it will be found that the "reticulated" film is far more (perhaps ten times) sensitive than the one prepared in the forty-grain bath, and perhaps five times as sensitive as the plate prepared in the eighty-grain bath. A long stay in the forty-grain bath will not produce so sensitive a film as a very much shorter one in either the twenty-grain or eighty-grain bath.

All this points to the fact that coarseness (or something concomitant with it) is favourable to sensitiveness, and that it is probably impossible to produce in a strong silver bath as sensitive a plate as in the very weak bath, because the mechanical conditions of the latter conduce to greater coarseness than does the energetic action of a strong bath. On the other hand, it may be impossible to produce an *even* plate by the weak bath, and, also, the granularity may be too great. However, as you understand, *theory* is only in question at the present time, and I think these trials lend support to my theory.

I find a plate may be prepared in a fifteen-grain* bath, and *appear* in even better condition than one prepared in a twenty-grain bath. The bromide is formed almost immediately, and is as dense as that of a plate prepared in an eighty-grain bath. I will, with your permission, write a further article for the Journal shortly on this subject.

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* I do not think the bath can be much weaker than this, as at even a greater strength than eight grains the bromide breaks away.

The "reticulation" seems to be a peculiarity of one sample of collodion, as another does not produce it, but only the "smears" in the direction of the flow of the bath. I have not yet tried the plates by this last sample, but expect to find the plates prepared in the very weak baths more sensitive than those made with the eighty-grain bath. I should say that I have used no organifier. I have only washed and dried the plates. The hydrosulphite of soda developer was used, diluted to half the strength I usually prefer, and the plates were developed together in the same dish. Thus there was no complication arising from evaporation of ammonia or from unequal action.

I could not perceive that one plate developed more quickly than another, but it was more difficult to see the development on the "weak bath plates;" and I should think that the development is really more rapid and easy, or how could we account for the greater amount of "sensitiveness" shown? I have not yet been able to satisfy myself as to how far the *whole* of the bromide is converted by a long stay in a (say) forty-grain bath. The bromide is certainly very transparent, but the image is fairly dense. The colour of the very sensitive "reticulated" film was in the "wormlike" markings of a copper tint, and the whole film, as far as I could see, was of that colour.—I am, yours, &c.,

Cotheridge Court, Worcester, HERERT B. BERKELEY.
September 4, 1877.

GELATINE EMULSION.

To the EDITORS.

GENTLEMEN,—Those who attempt anything new, especially in photography, in a spiritless, careless fashion rarely succeed, and, it may be reasonably said, scarcely desire success. But unfortunately for the community at large these gentlemen are the most ready to parade their failures in public, and, usually attributing them to any but the true cause themselves, prevent better men from trying their hands.

These remarks are by way of preface to our reply to your correspondent "E. D." This gentleman says he carefully followed the instructions given, and very much doubts the possibility of redissolving the precipitated gelatino-bromide because *he* failed. Here is a *dictum* with a vengeance, founded upon one incomplete experiment! and as an evidence of his carefulness and exactitude he has employed for re-solution water of *150°* temperature, when we expressly stated *100°*. Now, seeing that, by the alcoholic treatment, the gelatine has been robbed of its water, a little thought should have suggested the idea of varying his experiment, even if it did not strike him to do so before, by first soaking the pellicle in half the water *cold* for (say) twenty minutes; then to put in the remainder at a temperature of 100°, well shake, and gradually bring the whole to a temperature of 100°. He would thus have succeeded.

Would "E. D." commence the preparation of glue for any purpose by pouring *hot* water upon it? If not, why not? And why not apply the same treatment in the case of the gelatine pellicle, since the condition is the same? "E. D." has not, evidently, had a great deal of experience in compounding gelatine emulsions, or he would know that he might get a denser, less translucent film by using a lesser proportion of silver than fourteen grains to eight grains of ammonium bromide; the fact being that a gelatine emulsion with free bromide is much denser than one in which the exact equivalent or excess of silver is employed.

One remark, in conclusion, in reply to Mr. P. Le Neve Foster:—It is quite true that a good quality of methylated spirit may be obtained at six shillings per gallon; there is also one for which we pay more than three times the figure, because we can *rely* upon it, and it was this latter we recommended. Had we recommended the former some would have imagined any ordinary sample would be good enough, and by failure they might have condemned the process in consequence. Since we read Mr. Foster's letter we have tried the cheaper sample and found it to answer the purpose very well, so that those who have hitherto held aloof on the score of extra expense need hesitate no longer.

All we ask of photographers is to try the new method fairly on its merits, and we do not fear the result.—We are, yours, &c.,

38, *Great Queen-street,* WRATTEN AND WAINWRIGHT.
Long Acre, W.C., September 3, 1877.

To the EDITORS.

GENTLEMEN,—I cannot tell you with what joy I hailed Messrs Wratten and Wainwright's communication with reference to the washing of gelatine emulsion, as the great drawback to working gelatine was, in my estimation, the necessity to set the emulsion before washing. Well, now for the results of my experiments.

With my first emulsion, owing to the water in which it was set to emulsify being too hot, the plates, when developed, turned a bright orange.

In my second trial I followed the directions given, but, wishing for a little more time, after throwing down the emulsion with alcohol I put the pellicle away without redissolving till the morning, when, having added the water, I put the plate containing the pellicle into some hot water to dissolve it; but, alas! it declined to do so. I therefore had to give it up, and try again.

In my third experiment I added a little more gelatine to Wratten's formula, as I found the resulting emulsion from this was far too thin for my requirements. Proceeding as before, though with extra care in all details, I finally coated, dried, exposed, and developed a plate, which, alas! on examination proved not to have all the salts washed out; there also appeared on the plate little lumps, as if of undissolved gelatine.

Thus far my experiments go to prove the impossibility of thoroughly washing out all the salts by the method proposed. Perhaps, however, some of your correspondents can tell a different tale, and enlighten me as to my cause of failure.—I am, yours, &c.,

WILLIAM WAINWRIGHT, Jun.
Hoe-place, Woking, September 4, 1877.

TRANSPARENT SPOTS IN EMULSIONS.

To the EDITORS.

GENTLEMEN,—In a communication on the above subject which appeared in last Friday's Journal Mr. Wigglesworth says he entirely endorses my opinion to the effect that transparent spots are clearly due to insufficient shaking of the bottle containing the emulsion. I have been experimenting lately, as it were, in a retrograde direction. In place of trying to avoid these defects my object has been to produce them, and the results obtained have lead me to the following conclusions, which, although probably of little practical utility, may still be worth noting.

With a new and moderately thin emulsion, unless well shaken before use, a plentiful supply of spots make their appearance; but when the same is allowed to thicken by evaporation of the solvents, so that coating a plate evenly is attended with some difficulty, spots are not nearly so numerous, nor are they so large—in fact, a very moderate shaking may be depended on to ensure perfect immunity from these troubles.

The following extract, although written in illustration of another subject, is, I believe, singularly applicable here:—"The molecules of a viscid liquid move amongst themselves with difficulty, and they interpose the same obstruction to chemical attraction that they do to the attraction of gravitation. The atoms of substances contained in viscid liquids are impeded in their obedience to their mutual attraction."—I am, yours, &c., M. W. MAGAR.

19, *Lorrimore-square, Kennington Park, S.E.,*
September 5, 1877.

ON EXPOSING.

To the EDITORS.

GENTLEMEN,—A perusal of Mr. W. B. Bolton's interesting article on *Exposure*, in your issue of the 27th July, leads me to conjecture that a simple plan of exposure which I have used, and found successful in preserving clouds and distance in landscapes, may prove useful to others also.

Having uncapped the lens as usual, proceed to shut off the view from the sensitive plate by letting an angle of an open umbrella or parasol gradually down in front of the lens, at a distance of about one foot from it. By this means it will be perceived that the centre of the upper portion of the sky is first obscured, then the centre of the distance, and, lastly, the extreme edges of the foreground.

The above is the simplest method. A more perfect plan would be to have a chamber in front of the lens wherein exposure might be made, and closed by means of two wedges arranged to overlap each other by rackwork and pinion.—I am, yours, &c., J. C. HANNYNGTON.

Glandore, County Cork, September 1, 1877.

REDUCING OLD BATHS.—DROPPING-TUBES.—CARBON PRINTING.

To the EDITORS.

GENTLEMEN,—For the past nineteen years I have invariably thrown the silver from my baths by means of copper, and have recovered a greater amount of silver than was registered by the argentometer. This deception I always attributed to the alcohol and ether with which the bath was contaminated, never having gone so far as to take into account the chemical equivalents which you have so clearly given on page 388 in the Journal of the 17th instant. Permit me to describe the method I adopt for rendering silver chemically pure after precipitation by copper—a method which is economical, inasmuch as it saves time and material.

I moisten a tuft of cotton wool and insert it as a plug into the neck of the funnel, into which I afterwards throw the precipitate, and pour thereon liquid ammonia, repeating this as long as it produces a blue tint, which indicates the presence of copper. When colourless it is washed with common water, which removes the last traces of ammonia, as may be discovered by making use of red litmus paper. It is now ready for being dissolved in nitric acid. If this method be once tried no other will ever be had recourse to.

With respect to the dropping-tube described by Professor Stebbing: I agree with Sir Thomas Parkyns in considering it somewhat complicated. Useful dropping-tubes can be made, two at a time, in the following manner:—Procure some thin glass tubing costing a shilling or sixteenpence per pound, and by means of a saw file cut it into lengths for two dropping-tubes. Hold the centre in the flame of a spirit lamp, and keep turning the tube round so that the expansion and softening of the glass may be uniform. When this takes place twist the ends in opposite directions, at the same time drawing them apart until the two parts separate. If the fine ends are sealed break a little off them, and you have two dropping-tubes.

Concerning the preservation of dextrine, albumen, gelatine, &c., for mounting: I remember a method given by Mr. J. G. Tunny in one of your ALMANACS. I have seen the same preparation sold and represented to keep indefinitely. When the method was published I made some for myself, but it became useless after being kept five or six months. Still, it is the best mountant that I ever used.

It may not seem courteous to an experienced carbon printer like Mr. J. A. Spencer to express a difference of opinion with respect to his teachings; but, whereas he advises that a bath should not be used more than two or three times—especially if any interval of time be allowed to elapse between—I must state that mine has been mixed for three or four years and used very often, and yet it works as well as ever, although it has a mouldy smell. I keep it in a large stone bottle in which there is a bung. It is both my own opinion and that of some others that I am capable of working the autotype process with as much succcess as it is possible to be worked.—I am, yours, &c.,

Swinton, August 31, 1877. WILLIAM WESTON.

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DIAPHRAGMS FOR LENSES.

To the EDITORS.

GENTLEMEN,—Will you or some of your numerous correspondents inform me for what reason stops in lenses are black? Why not have them white? Accident usually leads to many discoveries and improvements. I do not suppose what I am about to relate has never been adopted before in an emergency, but still I think what I am about to describe is very suggestive.

I had set my mind on photographing a very beautiful subject, which was varied with water, trees with dark masses of foliage, scrub ferns, tall grass in the foreground—all combining to make up a very fine picture. The difficulty was to get a still day. A fine morning induced me to make the attempt, but, as usual, the gloom came on before I had fixed my camera. I waited patiently for more than an hour. The light improved; but when a gleam of sunshine appeared the wind disturbed the foliage. At last a lull in the breeze came, but no sun. I took off the cap, but I had only about two minutes before the wind put a stop to all further exposure; so I put up my instruments and left.

As my plates are 18 × 16 inches I did not expect to have more than an outline of a picture; but on developing I had a good one in parts—water, foreground, and distance all well defined, full of detail, but the trees were faulty in the shadows—so I determined to try again on the first favourable opportunity, which soon occurred. This time all was sunshine, with a white cloud in front of the camera. I concluded ten minutes would be ample time to get a fully-exposed picture; but, to my astonishment, when I had developed my plate it was as much under-exposed as my former plate with two minutes in a gloomy light.

The same day I made a journey of twelve miles to photograph a long, smoke-begrimed building in the centre of a large town. When I had my camera fixed I found I had forgotten my case of stops. To return for them was out of the question, so having a large business card, covered with letterpress on both sides, I cut it to the size and shape for a stop; then cut a jagged hole three-quarters of an inch in diameter in the centre, placed the card in the space for the stops, exposed ten minutes in the sun, and a second plate for about five minutes. Arriving at home I was anxious to test my plates; they were clean and full of detail when developed. This little incident rather shook my faith in black stops.

But to return to my charming spot of previous failures. Another favourable day came, which enabled me to make a third attempt. This was very successful. I exposed my first plate with a black stop, and to be quite sure of having a fully-exposed picture I gave it forty-five minutes, and, without moving the camera, a second plate with my before-named white card stop fifteen minutes. Both plates were good, but the second is very superior, being full of detail in both the light and shadow part of the picture. The lens I used is Dallmeyer's patent rectilinear, with the small stop three-quarters of an inch diameter.—I am, yours, &c., REUBEN MITCHELL.

Willow Bank, Sharples, Bolton, September, 4, 1877.

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Miscellanea.

ROYAL CORNWALL POLYTECHNIC SOCIETY.—We learn from the *Western Morning News* that Mr. William Brooks, on Wednesday, the 29th ult., delivered a lecture on *Photography* in the Polytechnic Hall, Falmouth, Mr. N. Carne in the chair. The object of the lecture was mainly to introduce and explain the most recent inventions in the photographic art, both in the camera and lenses, and the chemicals necessary for the preparation of plates, as well as an entirely new apparatus for the generation of oxygen gas. The camera was now remarkable for its compactness and adjustments, while its simplicity in packing and its strength would have been a recommendation in its favour, even were it not that by means of it photographs, whether landscape or otherwise, could be taken with great facility and freedom from distortion, owing to the nature of the adjustments. The lecturer then explained what is known as the emulsion process; that was, the nitrate of silver and the bromides were mixed with the collodion, and so doing away with the nitrate of silver bath. The plates could, therefore, be used either moist or dry, and their long-keeping qualities, both before and after exposure, were much improved. The negatives produced by this process were not only finer, but did not give those violent contrasts sometimes seen in the ordinary wet process with the bath. The lecturer then gave some practical illustrations on the canvas of the use of Young's patent oxygen apparatus, by means of which all danger was avoided, and the gases were generated at the time of using.

PHOTOGRAPHY IN COURT.—DAMAGE DONE TO AN ENLARGEMENT.—At the City of London Court, on Tuesday last, the case of Rembert *v.* Rumbull was heard before Mr. Besley, acting as deputy judge. In this case the plaintiff, a merchant residing at Tulse Hill, but carrying on business in the city, sued the defendant, a photographer, of Brixton, to recover the sum of £5, being for damage done to an enlarged photograph of the plaintiff's wife, which the defendant had executed and for which he had been paid, but was delivered broken and rendered perfectly useless. At this stage of the case Mr. Beal, the defendant's solicitor, objected to the jurisdiction of the court, as both plaintiff and defendant resided within the jurisdiction of the Lambeth County Court. His Honour, on hearing that the basis of the contract took place in the city, overruled the objection. The plaintiff's wife was called, who said that when the case containing the picture was delivered it was cracked in two. The defendant, in reply, said that every care was taken in packing the portrait, as he was informed it was to go into the country, and contended that the accident must have occurred by the plaintiff's servant having let it fall, as it was in a heavy frame, and was too heavy for one person to lift. The defendant's man was called, who said he was assisted in taking the case into the house by the plaintiff's maid servant, who let her end of the case slip, and the jar must have caused the picture to slip, although it had been tightly fixed in a frame. Upon hearing this statement his Honour considered that the defendant had clearly rendered himself liable, as his duty was to have seen the picture safely delivered without pressing the plaintiff's servant into his employ. She had merely rendered a voluntary service for which the plaintiff could not be considered liable. It ought to be known that tradesmen delivering goods liable to breakage, such as large photographs, should deliver them carefully themselves, without employing the aid of their customers' servants. Judgment was accordingly entered for the plaintiff for the full amount claimed with costs.

THE NEW METALS ILMENIUM AND NEPTUNIUM.—About thirty years ago R. Hermann announced the discovery of a new metal, ilmenium, accompanying tantalum and niobium in various minerals, and closely allied to them in its general characters. Several years later he relinquished his claims to the discovery, in consequence of researches by Marignac in the same field leading to entirely different results. Later investigations have, however, strengthened his belief in the existence of ilmenium, and in the February number of Kolbe's *Journal für praktische Chemie* he not only brings forward results tending to establish the individual character of ilmenium, but describes a new metal, neptunium, belonging to the same group, and occurring in tantalite from Haddam, Connecticut. As the quantities obtained are small, the characteristic reactions limited, and as the spectral properties cannot be made use of, chemists will naturally reserve their opinion till confirmatory observations have been made by some other well-known investigator. The following are the essential results obtained by Hermann:—The mineral was found to consist of equal portions of columbite ($ROMe_2O_3$) and ferro-ilmenite (RO_2MeO_2). By fusion with potassium bisulphate the hydrates of the metallic oxides were separated out in the following proportions:—Ta_2O_3, 32·39; Nb_4O_7, 36·79; Il_4O_7, 24·52; Np_4O_7, 6·30; total 100. The hydrates can be changed into double fluorides, and from the greater solubility of potassium neptunium fluoride, it may be obtained free from tantalum and ilmenium salts, but retaining a small quantity of the niobium salt; these, however, on being changed into niobate and neptunate of sodium, may be separated on account of the greater solubility of the latter. By fusion of the neptunate of sodium with potassium bisulphate and treatment with water, the hydrate of neptunic acid was obtained in a pure condition. Neptunium may be distinguished from niobium and ilmenium by its having, along with tantalum, the property of forming an amorphous insoluble precipitate on the addition of caustic soda to the boiling solution of the fluoride; the other two form crystalline and easily-soluble compounds. The very soluble character of neptunium potassium fluoride as compared with the corresponding tantalum salt serves to distinguish it from that metal. The reactions with phosphorus salts in the inner part of the Bunsen flame are the following:—Tantalic acid, colourless; niobic acid, blue; ilmenic acid, brown; neptunic acid, wine yellow. Addition of tincture of galls to solutions of the sodium salts give characteristically-coloured precipitates. The atomic weight of neptunium, determined from the double salt $4KFl+Np_2Fl_7.2H_2O$, was found to be 118. Hermann has also obtained ilmenium in the form of a black powder by heating potassium ilmenium fluoride with potassium chloride and potassium.—*Nature.*

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EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale*, that being done at a small cost in our advertising pages. This portion of our columns is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

Wanted, a No. 2 wide-angle landscape lens, or 5 × 4 rapid rectilinear, in exchange for a patent stereographic lens four inches focus; equal to new. Cost £4 5s. Difference in cash.—Address, E. J. Chesterman, Brocco Bank, Ecclesalt-road, Sheffield.

A pair of sciopticons for dissolving, with cabinet and legs complete, and oxy-hydrogen jets to same, together or separate; also pantascopic camera for plates 11 × 7, a splendid instrument; camera for making stereoscopic or lantern transparencies by the wet process; also, Smartt's tent, by Murray and Heath, when erected a perfect dark room, will be exchanged for scientific apparatus.—Address, W. J. C., 19, Bradshaw-street, Moss Side, Manchester.

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ANSWERS TO CORRESPONDENTS.

Photograph Registered—

James Fitzgerald, Kidderminster.—*Portrait of Arcangelo Corelli.*

☞ *Correspondents should never write on both sides of the paper.*

Notice.—Each correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a *nom de plume* as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

J. W. Gough.—Received.

J. Cockburn would be glad if any reader will give him information concerning subnitrate of mercury as a sensitising medium, together with the composition of the bath, the collodion, &c.

M. W. J.—We cannot tell whether such a picture has been entered at Stationers' Hall without consulting the registry kept there. It is not necessary in issuing or publishing a registered photograph that it bear either the word "registered" or the name of the photographer by whom it was taken.

A. J. C.—It is probable that the emulsion may be rendered once more fit for use by adding to it a solution of bromide of cadmium until the whole of the free nitrate of silver is converted and a little bromide left in excess. Now coat a plate and give it a thorough washing in order to eliminate the soluble bromide, coat with a tannin preservative (ten grains to the ounce), and expose. If the result be not a clean negative we advise you to precipitate the pyroxyline (with the bromide of silver) and dissolve it afresh. It may, perhaps, be safer to try the effect of adding only *very* little bromide at first—not quite so much as would be required to effect the complete conversion of the silver, more being afterwards added if upon trial this be not found enough.

Varnish (Aberystwith).—This correspondent writes as follows:—"I shall feel very much obliged if you will, through your 'Answers to Correspondents,' describe to me the best way to varnish a negative. I know that it is generally stated 'do it before a bright fire;' but this I find very scorching to the tips of the fingers, besides being very unpleasant to one's bodily comfort, especially in hot weather. I have tried over a gas flame, but with very indifferent success; for sometimes the varnish catches fire, and if it is a large plate the *result* is very unsatisfactory. I have also tried with the gas distributed through wire gauze, but this is even worse. I have searched through several of your volumes and also through several instruction books, but the subject is generally passed over very slightly as one of no importance. I shall feel much obliged for your assistance in the matter." ——Now what *can* we say in response to this communication? The varnishing of negatives is admitted by every photographer to be more or less of a nuisance, but we have scarcely ever seen its evils more pointedly set forth than in the foregoing letter. If the negative be of small dimensions it may be very well heated to the required degree of temperature over an ordinary gas flame, care being taken to move it about so as to secure uniformity of heat. A light frame or holder of wirework may be employed in heating the plate if necessary. The temperature should be such as would create an uncomfortable feeling if the plate were allowed to lie for any length of time upon the back of the hand. If the varnish be poured slowly over such a plate (it being, of course, removed from the flame) it may be spread from corner to corner in an even, bright sheet, and when drained off at one corner will present an unbroken glassy surface. If this be not the case the varnish is unsuitable for the purpose, and another sample must be substituted.

J. Unwin.—Mr. J. Solomon, of 22, Red Lion-square, London, is the only one we know who supplies the salt wanted by you for ceramic purposes.

W. H.—1. The lens will be correctly put together if you adhere to the order given in your drawing, namely, the least convex side of the crown glass lens next to the ground glass.—2. Good results, so far as regards definition, can be obtained by enlarging on negative paper to four diameters, but unless great skill be displayed the enlargement will be lacking in respect of brilliancy.—3. A solution of carbonate of ammonia will keep well under the circumstances described.

H. Manfield.—1. Thanks for kind attention.—2. Among the various non-actinic backings for dry plates we do not find any to surpass the one we described a short time ago, and which consists of a small quantity of Spanish brown mixed with water to the consistence of a thick fluid, to which are then added a few drops of a solution of gum arabic to impart coherence, and just enough of glycerine to prevent it from drying too hard. The consistence is such that when this backing is quite dry it can be removed by almost a single application of a wet sponge. Many persons make a mistake in applying a very thick coat of the non-actinic backing; it will be found equally efficacious if it be applied very sparingly, so as merely to impart a red stain to the surface of the glass.

C. F. C.—Replying to the query of J. M'Lachlan, our correspondent says:—"I shall strongly advise the admirable mountant given in this year's Almanac by Mr. John A. Spencer:—

Dextrine	8 ounces.
Glycerine	2 ,,
Water	4 ,,
Spirit	4 ,,

I find that with chromotype pictures they scarcely lose any of their gloss, and therefore I presume that this cement would equally answer for enamelled prints." Our correspondent further says:—"Will you kindly in your next advise as to the best varnish for protecting transparencies under the following circumstances:—Carbon pictures, coated with a gelatinous compound in place of ground glass, and placed in a window close to the ordinary panes of glass. I have used the 'ground-glass' varnish but find that it soon discolours, and, worse still, reticulates to a fearful extent when any damp reaches it." On this subject we solicit information.

Received.—*Dublin University Magazine; Practical Lessons in Painting on China, Porcelain, and Enamel; The Losing Game*, by Murray Russell; *Catalogue of the Fourth Annual Exhibition of Pictures in Brighton; Street Life in London*, Part 8. Our notices of the foregoing must stand over till next week.

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Solar Camera Enlargements.—Our readers may remember that a few weeks ago [*ante* page 326] we gave an account of some experiments we had made in carbon printing with one of Dr. Van Monckhoven's enlarging cameras belonging to Mr. Viles, of Pendryl Hall, Wolverhampton, with a view to ascertain how far such instruments would be available for the ordinary requirements of the professional photographer. Notwithstanding that our experiments were made "en amateur" the results obtained were highly satisfactory. We have recently been favoured with an opportunity for examining some enlargements produced in a similar manner by Dr. Monckhoven himself, which confirm in the strongest manner the favourable opinion we then expressed. These enlargements, although perfectly untouched, equal in every respect the best enlargements we have seen, even when a considerable amount of artistic work had been bestowed upon them, and are certainly superior to any prints we have seen from enlarged negatives that have not been much retouched. We understand that these cameras have recently been greatly improved; but the precise nature of these improvements will be described in detail in our promised forthcoming article on the enlarging apparatus in question.

METEOROLOGICAL REPORT.

Observations taken at 406, Strand, by J. H. Steward, Optician.

For the Week ending September 5, 1877.

These Observations are Taken at 8.30 a.m.

Aug.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks
30	29·882	W	57	61	69	55	Cloudy
31	29·922	W	55	60	69	51	Cloudy
Sept. 1	30·120	W	48	51	67	45	Cloudy
3	29·662	NE	53	55	60	51	Cloudy
4	30·248	N	49	52	62	47	Cloudy
5	30·376	N	49	52	67	45	Hazy

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 906. Vol. XXIV.—SEPTEMBER 14, 1877.

SPOTS ON DRY-PLATE NEGATIVES.

Of the various defects encountered in dry-plate work perhaps the most general and, at the same time, most formidable is the liability to "spots" of different descriptions. This tendency, though not altogether confined to dry plates, is, from various reasons, more general, and, owing to the circumstances of manipulation, more frequently met with in working that class of plates than in operating with the wet process either in the studio or in the field. At the present time a considerable degree of importance attaches to the question, both on account of the numerous complaints which are heard on all sides of the prevalence of the evil and the difficulty of recognising the exact cause, and we have been induced to give some attention to the matter with the view, if possible, of throwing a little light upon the subject.

Spots, so called, are of various descriptions—some arising obviously from particles of dust either contained in the collodion or emulsion, or which have become attached to the film during the process of preparation; others, again, being much more difficult of explanation. Of the latter description there are the transparent and opaque forms—the most formidable variety, because they most completely baffle all attempts to trace them to their source, being those which have acquired the name of "transparent spots with a nucleus." These, though not, perhaps, strictly speaking, new, have attained a greater importance during the last year or two, since the introduction of washed emulsions; but why they should be more common to that process than to others we cannot distinctly say, though we have formed a theory which may at least partially explain why they make themselves more troublesome under the conditions attaching to the process spoken of than when the circumstances of manipulation are different.

It is not a little remarkable that most processes have their own special defects; that is to say, exhibit a greater liability to some particular imperfection than to any other. This is more especially noticeable in connection with the various dry processes, most, if not all, of which have their own "pet" failings. It is not necessary to go through the list of such failings; but, considering that the fundamental principle of all the methods is the same, and that the "process" consists merely in some variation in the minor details, it would appear that the individual defects encountered are due to some peculiarity in the conditions which bring this or that form of imperfection into greater prominence in one process than in others.

With this idea in our mind we have endeavoured to discover in what manner the washed emulsion processes should be more liable than others to the peculiar "transparent spots with a nucleus." It is remarkable that some operators complain sadly of this defect. Some indeed have relinquished the process solely on that account; while, on the other hand, others experience little or no difficulty from that source. We ourselves are unable to lay any special blame upon any of the modifications of the washed emulsion on this score. We may say that we have enjoyed a pretty general immunity from this obnoxious pest, even when working with the same emulsion which, in other hands, gives rise to complaint, though on one or two occasions the defect has made itself apparent without any evident variation from the ordinary course of manipulation. The same may be said of other workers from which it would appear that we must look for the cause to some of the trivial details of the process rather than to the chemical conditions involved.

In order, then, to trace the inducing cause of the particular form of "spot" to some variation in the details of manipulation, we have carefully noted the exact method followed by several emulsion workers, both in the manufacture of the "pellicle" and emulsion and in the subsequent preparation of the plates. At an early stage of the search we were struck with the fact that, amongst those who are in the habit of using commercially-prepared emulsions, we found some who habitually encountered the defect, whilst others were totally unacquainted with it. This strengthened the opinion already formed that it is not inherent in the process, but arises, as we have said, from some variation in the working details of the preparation of the plates.

We may say that almost all to whom we have spoken, as well as those who have written on the subject, attribute the defect to the influence of dust in some form; but the question naturally arises—"If this be really the cause, why should it affect one and not another?" Presuming that in all cases a proper amount of care is taken to avoid, as far as possible, the presence of dust (and we have no reason to doubt in any of the instances where the spots have been encountered that such care has been neglected), it would seem difficult to account for the trouble in that direction. In the matter of filtering the emulsion, dusting the plate, and every detail which might be observed in order to avoid dust, our informants were one and all unanimous in giving the enemy no chance; indeed, throughout the whole course of manipulation we could notice but one variation—some employed artificial heat in drying the plates, others allowed them to dry spontaneously.

There appears little to catch at in that, and we attached no importance to it until, on discussing the matter with a gentleman who has suffered considerably from spots at times, he remarked that he found a greater liability to the large circular spots when the plates were allowed to dry spontaneously than when dried rapidly by artificial heat. Ready to grasp at anything, however slight, we set to work to establish a connection between cause and effect; and, looking back at our own experience, we were obliged to acknowledge that it tended in the same direction. As a rule, we may almost say invariably, we use artificial heat, but on one occasion a few months back, when we made our principal acquaintance with circular spots, transparent and opaque, we were working away from home, with no source of artificial heat available, and were constrained to leave our plates to dry spontaneously; the result was, what we had never previously experienced, a plentiful crop of that form of marking.

This set us pondering, and after a while, taking dust as the starting-point, we succeeded in forming a theory (since proved by actual experiment) which explains how the large circular spots may make their appearance in some cases and not in others when the conditions are to all appearance in every way identical, the real difference arising entirely from the mode of drying. Briefly stated it is as follows:—Imagine a particle of dust to become attached to a film during the operation of coating the plate; the plate is dried *rapidly* by artificial heat before the speck of dust, whatever its composition may be, has had time to exert any injurious influence, and when once dry it becomes inert and appears on the developed picture merely as a speck. On the other hand, let the same plate be put away in a close place—a drying-box or closet—to dry *slowly*. The speck of dust in the presence of moisture commences gradually to exert a certain influence upon the film, and in proportion to the length of time which elapses before its power is arrested by the desiccation of the film so will the radius of its action be extended, the final result being a *circle*, transparent or opaque, according as the nature of the speck may be of a restraining or reducing character.

Putting this theory into practice, we found that a film sprinkled immediately after coating with various forms of dust in very fine division, and dried immediately, resulted simply in minute specks, opaque or transparent, according as the dust adhered to the film or was removed during washing and development. A plate similarly treated but allowed to dry spontaneously exhibited a fine crop of circular markings, some opaque, but by far the greater number transparent, and having a nucleus—in some cases opaque, in others transparent, showing the depression from which the minute particle of dust had been removed during the development. It is easy to explain why these markings should be more commonly met with in washed emulsion plates than in others, for any dust that might attach to the surface of the latter description of film in coating the plate would be nearly certain to be dislodged in the various operations to be gone through before drying. The organifier, too, may be supposed to exert some influence in localising or arresting the action of any foreign matter which might remain attached to the film during desiccation.

This is quite in accordance with the experience of Mr. Woodbury, Mr. Ellerslie Wallace, Jun. (of Philadelphia), and others, who have written to us stating that when the plates are dried by a strong heat immunity from spots is secured. Mr. Wallace, in a note not written for publication, says:—

> "You may possibly call to mind a conversation we had on the subject of transparent spots on washed emulsion plates. Very shortly after seeing you I paid a visit to Mr. Woodbury, who showed me some of his beautiful negatives made in Italy on 'washed emulsion.' As they were perfectly free from the defect in question I asked him whether he could give me any assistance in getting at the cause of the spots. He did not offer any *direct* explanation, but said that he always dried the plate by heat as soon after coating as possible, or, in other words, as soon as the film was thoroughly set. When I told him that (in accordance with instructions received from those practising the washed emulsion process largely in America) I had set the plate up to dry spontaneously after coating, he emphatically condemned this, saying that dust would be sure to settle on the film and cause spots of *some* kind, even if not the transparent *holes* I spoke of. At the first opportunity I prepared some plates according to his advice, but found that I could not dry the film evenly and free from *drying lines* if I set it over the lamp as soon as the emulsion set; but on a second attempt I allowed the film to get *surface dry* (or half dry) before applying heat, and the resulting negatives were of so admirable a quality that I am desirous to study the washed emulsion process for myself."

We offer the remarks in this article merely as a step towards the solution of the question of spots. We are aware that it does not place us in a position to do more than palliate the evil, unless we can guard completely against any contact of dust particles during the coating of the plates. Nor does it prove that the source of the spots is not contained in the emulsion itself. It is obvious that minute particles of matter may be present therein and yet exert no visible influence upon the large body of matter with which they are in contact; but when spread upon a plate, and their action, as it were, concentrated upon a small area, the effect under favourable circumstances would be, as we have described, the formation of circular markings.

A NOVELTY IN LANTERNS.

One light and one lantern for producing dissolving views form the theme on which we are now about to write. As every lantern exhibitor is aware, dissolving views are produced by means of two lanterns, each being complete in itself so far as regards the lighting and optical arrangements, the dissolving being effected by superseding on the screen the image from one lantern by another image from the second lantern, the arrangement of the light being such that one picture is caused to merge gradually into the other.

It has long been a matter of intense desire on the part of those interested that the dissolving effects could be obtained by means of a single lantern. Hitherto the bi-unial lantern has been the nearest approach towards supplying this desideratum; but in that apparatus, although the whole system is comprised in one body, there are everything required for two distinct lanterns, including two lights. Now it is precisely in this matter of more lights than one that the whole objection lies. The vagaries of the lime light requires one to be constantly on the *qui vive* lest the intensity of the illumination of one lantern should exceed or fall short of the other.

If two lights be kept constantly burning from the beginning to the end of an exhibition, one to each lantern, it is found to be unpleasantly expensive, and hence has been adopted the system of supplying the oxygen (the costly element in lantern illumination) first to one and then to the other lantern in a reciprocal manner, one lantern being "off" during the time the other is "on;" and the act of dissolving now usually consists in the turning of a tap, by which the oxygen is diverted from the lime in one lantern to that in the other, the hydrogen, owing to its small cost, not at all being taken into calculation.

A number of years ago, at the establishment of a Liverpool optical firm, Messrs. Chadburn and Son, we saw an instrument in which the idea was carried out of making *one* light answer for both lanterns, the latter being placed at right angles to each other on the same base, the lights emanating from the lanterns being directed forward to the screen by means of reflecting prisms attached to either one or both of the objectives. As our knowledge of, and acquaintance with, the instrument in question was acquired merely from a casual examination through the window of Messrs. Chadburn's establishment several years since, we must be excused from entering into detailed particulars. The lantern which attracted our attention was one intended, so far as we remember, for use with the electric light.

We are now about to describe a lantern differing in certain respects from anything we have either before seen or heard of. In the Liverpool lantern the electric light was used; the ordinary lime light is applied to that which, by way of contrast, we shall designate the London lantern. Success is not the test of ability, although some shallow dogmatists may assert it to be so; but, quite apart from any intrinsic merit displayed in the two lanterns to which we have attached local appellations, we imagine that the later instrument will be the more popular, because it meets existing lantern requirements. The electric light is not now pressed into the service of the exhibitor of dissolving views; but it is not so with the lime light.

A few days ago we were asked by Mr. F. York to examine a lantern which he brought to our office for that purpose. It was, we found, the result of an attempt to combine in *one* lantern that for which two lanterns have hitherto been utilised. The lantern shown to us was one of small dimensions, its chief peculiarity consisting in a second optical system—that is, condensers and object-glass being attached to one side of the lantern in addition to the system connected with the front. Let us suppose, now, that the two photographs with which the systems are charged are to be shown upon a screen in succession, one to be *dissolved* into the other. There being only one light the full force of that is first directed forward upon and through the picture interposed in the direct line of the screen; but the lime light burner is placed upon a pivot at the bottom of the lantern, the axis of rotation being as near as possible equal to the surface of the lime from which the light proceeds. By rotating the burner through a quarter of a circle the flame is now directed towards the picture in the optical system on the side of the lantern, and by the very act of rotation one fan is made to shut off the light emanating from the nozzle that has just been in use, while another is being withdrawn from that towards which the light is now being directed. But, it will be said, the image from the latter nozzle will be thrown to one side instead of being projected forward to the screen. True—so it would; but a rectangular prism in front of the objective of this system projects the image in a forward direction, the result being that both pictures are blended upon the same disc. One of the pictures thus becomes feebler in proportion as the face of the incandescent lime is turned to the other, especially as the turning is accompanied by the more direct obstructive agency of an opaque shutter or fan, which simultaneously is made to pass over the cone of rays emanating from the object-glass.

From what we have said it will be made obvious that dissolving views can be exhibited in the most perfect manner by means of one light. The lantern we examined was the first of the kind yet made, and is, we understood, to form a model from which many others are to be constructed; so that we imagine the improved dissolving lantern will probably become an object of interest at the meetings of the various photographic societies at the close of the present recess. It may, at this stage, be reasonably anticipated that our readers will, before long, hear more from us in connection with "Keevil's Patent Newtonian Lantern," by which designation the instrument was introduced to our notice. That it will prove an important accession to our photographic appliances there seems no reason to doubt.

THE USE OF SCREENS FOR LENSES.

The letter by Mr. Reuben Mitchell, published in our last issue, upon the use of a reflecting stop, opens afresh what is practically the old issue of supplementary exposure to white light, though in his case it can neither be called *pre*-exposure nor after-exposure, seeing that the two operations take place simultaneously. Mr. Mitchell uses a diaphragm of white cardboard, and states that he found himself able to give an exposure amounting only to a third of that he gave with the ordinary black stop.

Leaving for a moment on one side any consideration of the possibility of error on account of the great difference in exposure that an apparently slight difference in the diameter of the aperture in the diaphragm would entail, we would say that though this as an isolated case would seem to prove most decidedly the advantages of the supplementary exposure, we yet cannot admit it as proof positive of the unvarying usefulness of the method. That it has certain advantages there is no doubt, but we should not accord to them anything like the weight Mr. Mitchell considers their due. Yet, granting the usefulness, it is certain that that accurate discrimination of niceties of lighting and exposure upon which so much depends, and upon which so much care is bestowed by our best operators, cannot but be interfered with if the supplementary lighting be anything but what is under entire control and able to be accurately guaged, mentally or otherwise. This method with white diaphragms, like many others that have been proposed, lies under the objection of want of regularity and control. But while the rapidity of exposure may be thus increased, we consider that the "*pre*" or "*ante*" exposure fails to give the very highest qualities a first-class negative ought to possess, and hence we should recommend that all precautions be taken to shield the lens and camera from every possible ray of light, in order that clear negatives may be confidently looked for. If afterwards it were required to supplement the exposure, nothing could be easier than to expose to a definite source of light for a certain proportion of time after or before the main action of the image.

In order to prevent the action of adventitious rays it is necessary that the camera be light-tight and that no light enter the lens except that from the image itself; and it is to ensure the fulfilment of the latter condition that so many kinds of sky-shades and screens have been devised to prevent both the diffused and particular action of light. For the outdoor use of shades, so far as relates to the particular object under consideration, little is required of them beyond the keeping from the lens of the actual rays of the sun; but in the studio much more is required. The glare from the sky, the reflection from an oilcloth floor, from bright objects, or light walls, all contribute their quota to assist in dimming the brightness of the picture.

The need of some screen was seen in the earliest days of the art, and for that reason portrait lenses were made, as they are at the present day, with a long permanent hood to their front, which they were enabled to do from the very small angle of view a portrait lens is required to take in. A hood, such as we are alluding to, affixed to a modern outdoor instrument would render it impossible to include a wide angle. Its real usefulness is not generally appreciated, or, in one form or another, no one would be without them. We have, however, seen several instances of late which have forcibly brought to our mind the desirableness of every camera being fitted with such a screen.

In one case we have come across, the use of a long velvet screen with hanging flaps served to cure an unaccountable case of local fog which had given trouble for a long time. The sliding front of the camera was not perfectly light-tight, and under certain conditions of light arrangement the whole length of the upper part of the plate for about a third or half an inch deep had a distinct band of fog; but upon a screen, as described, being fixed to the lens the light was prevented from entering the slit entirely, and thus the evil was exorcised.

In another case an open skylight above and behind the sitter turned out to be the cause of a very peculiar local marking, which only made its appearance upon very bright days. It appeared that the light from this window entered the lens, and within the camera fell upon the framework of the repeating back immediately in front of the lens, and, owing to a drop of varnish having, at some time or other, accidentally dropped upon the face of this framework, it formed a semicircular reflecting surface, causing upon development of the plate a well-defined circular object. The use of a screen, again, in this case destroyed this peculiar image and gave a plate quite free from fog. Again, in a case wherein a lens had a scratch upon the anterior surface: when the light from the sky fell upon it sufficient was scattered to produce general fog over the whole surface of the plate; the screen put an end to this. Similar instances might be multiplied to any extent, while the glare from surrounding objects generally, in a multitude of cases, leads to a diminution in that brightness of the image which for portraiture in particular is so essential.

Many forms of shades have been devised, each having advantages of its own, one of the earliest being a cylindrical-shaped hood lined with black velvet and slipped on to the lens hood—a form which may be seen recommended in some of the earliest works on the art. One we have lately seen, which appears to possess a maximum of advantages and a minimum of defects, we may describe. It consisted of a light, square, wood framework, lined with velvet, having the pile inside, not out, as such things are usually constructed; this was then attached to a long piece of wood, which slid backwards and forwards underneath the top board of the camera stand, so left scope for entering. It can be brought so far forward as almost to intrude upon the actual image itself, or it may be pushed back so far as to suit all variety of lenses; and the object of attaining clean and faultless negatives is most materially aided by this inexpensive little contrivance. A flap at front serves to restrict the field of view when required.

We know from personal experience with this particular camera that the hood we describe is most useful, and we were told that it had been made to a certain scale drawn out upon paper beforehand. A diagram was made to scale by first setting down the extreme height and the breadth of the background that could possibly be included in (say) a cabinet picture, and then drawing lines to them from the lens itself (also drawn to scale). Next, the length of the hood having been fixed upon, the dimensions of its anterior (and, consequently, through its being rectangular, its posterior) aperture were simply obtained by setting this length off in front of the lens plan, and measuring the width of the diverging lines at the point. Such a screen can be made by any joiner for a little money, which would be well expended; and, indeed, it could be equally efficiently extemporised by a piece of stout bent wire with a piece of velvet.

THE PRACTICAL DETAILS OF THE GELATINO-BROMIDE PROCESS.

We were pleased to see from the communication of Mr. Wm. Aston, published in last week's Journal, that one gentleman had at last succeeded with the new method of extracting the nitrate salt from a gelatine emulsion. The operation is in itself so simple that we have been surprised to learn that anyone had failed with it. We have been led, in consequence, to inquire into the cause of these failures.

One cause has, beyond doubt, been due to the employment of excess of silver nitrate, and others are apparently due to insufficient attention to minor details, such as temperature of water, &c. Your correspondent, Mr. Wainwright, Jun., in his first attempt discovered "orange" fog, and this he attributed to the use of water "too hot." The true cause of orange-coloured fog is excess of nitrate of silver under prolonged digestion. Anyone may test this for himself by adding the nitrate of silver first to the gelatine and afterwards the bromide; this will infallibly produce orange fog. It is, perhaps, too much to expect of a young experimentalist strict attention to small matters, though to neglect them is to fail continually. Mr. Wainwright, Jun., speaks of "hot water" and water "too hot." These terms are very indefinite, and may mean any temperature up to boiling point. The temperature given for his guidance is 100°. He may employ this with absolute safety, and we recommend him to determine this by a thermometer.

We will now give, as concisely as possible, working details and formula so simple that he who tries can scarcely come short of success.

To Make Five Ounces of Gelatino-Bromide Emulsion:—

FORMULA.

Gelatine (Nelson's No. 1)	90	grains.
Ammonium bromide	45	,,
Silver nitrate	75	,,
Water (distilled)	5	ounces.

Select a twenty-ounce bottle with a securely-fitting stopper. First pour in four ounces of the water, dissolve therein the bromide of ammonium, then add the gelatine, and leave to soak for one hour. The advantage of a well-fitting stopper will be obvious; for if, in shaking up, any of the liquid were lost, some of the bromide salt would go therewith, and the balance would be disturbed. There is a manifest advantage in first dissolving the bromide salt in the water, for we thus succeed in evenly and equally distributing it throughout the whole body of the gelatine; and, if precaution be taken in regard to the stopper of the bottle, there need be no loss of bromide. Next, dissolve in a separate bottle seventy-five grains of nitrate of silver in the remaining ounce of water. Place the two bottles in a jar or jug of water of 100° temperature, and solution of the gelatine will quickly take place. Now carefully unite (in the dark room, of course) the contents of the two bottles. The nitrate of silver solution may be slowly stirred into the bromised gelatine, or it may be added in small quantities with a thorough shaking between each. Either method, if *well* done, is efficient. We have now a gelatino-bromide emulsion containing a slight excess of bromide, and this slight excess, while not in any marked degree detracting from its sensitiveness, will be found of eminent service when we arrive at the developing stage. By the addition of the nitrate of silver to the bromised gelatine an action termed "double decomposition" is originated; in other words, an interchange of elements takes place between the two salts. If nitrate of silver were added to water containing bromide of ammonium in solution, an interchange of elements would instantly take place; insoluble bromide of silver would subside, and nitrate of ammonium would remain in solution or suspension. But gelatine, being a viscid medium, retards this chemical interchange, and therefore time must be given to bring it completely about. In order, therefore, to keep the gelatine in a liquid condition we place the bottle in water of 100° temperature, and it is found in practice that a period of from four to six hours will complete the double decomposition.

If water of a higher temperature than 100° be employed the interchange will be completed in a shorter space of time, as the gelatine being thereby rendered more limped presents less obstacle. But we must bear in mind that 100° is a safe temperature, and that a higher temperature can only be employed at the risk of decomposing the gelatine, the results of which would be inconvenient at the final stage of development, these results being blisters and frilling.

A period of six hours having been given for digestion take out the bottle of gelatino-bromide emulsion and pour into it ten ounces of good methylated alcohol. The effect of this will be to extract the water containing the soluble nitrate of ammonium and to precipitate the gelatine containing the insoluble bromide of silver. In from half-an-hour to one hour the alcohol and water may be poured off, and with it goes the nitrate salt—which is an indispensable elimination—from the emulsion. The bromide of silver is the sensitive salt; the nitrate of ammonium is not sensitive to light, and if present in the film would, in a measure, arrest the action of light upon the bromide and bring about insensitive spots and lines—transparent after fixing in the hyposulphite solution. It is well to let as much of the water drain out as possible and not to hurry the operation, there being a multitude of cellules in gelatine which will empty themselves if time be given, and, as the nitrate salt is evenly distributed throughout the water, it is manifest that the water should be all, or very nearly all, withdrawn; and in proportion to the completeness of this extraction the better will the plates work and keep.

When the whole of the water has trickled out and been poured off, to effect re-solution add four and a-half ounces of distilled water and leave to soak one hour. Now place the bottle, as before, in water of 100° for twenty minutes, and a few vigorous shakings will cause it to perfectly redissolve.

It is now desirable to filter the emulsion to take out the air-bubbles, and this is better done through flannel than through fine linen. A suitable filter may be made by cutting off the bottom of a bottle. Tie the flannel over the neck and let it project one inch lower than the neck when inverted, to give air for facility of filtration. Now invert the bottle, and pour the emulsion into it, and let it pass through into a second bottle. This filtration will be none the less perfectly performed if done more than once; what is worth doing at all is worth doing well. We have now an emulsion of fair sensitiveness, good latitude in exposure, easy in development, and which will give all desirable density with as much freedom from halation as a bromide emulsion is capable of giving.

We hope the foregoing will be found useful to a numerous class of readers who have a natural love for photography, but to whom a question of expense is an obstacle to the use of commercial productions, and to all those who take delight in understanding "the why and wherefore" of that which they do. If so, our recompense will be all sufficient. WRATTEN AND WAINWRIGHT.

CHROMOTYPE CARBON PRINTING.

I THINK it may interest the profession to know how the pioneers of chromotype printing are getting on; and, as complaints of difficulties are still heard, I am willing to contribute my experience, with a hint or two as to fresh matters and opinions. I think I have got two points just worth noting, one of them being, I consider, of essential importance. However, I shall throw them, with a few remarks, into general circulation, and, as the matters are practical, any discussion that may follow will, I dare say, prove of service.

First: let me say that my satisfaction with chromotype printing increases. I positively find *no* difficulties, and the favour of the public towards permanent prints augments every day. Not only in portraits, but in landscape work, chromotypes are demanded; and although in Salisbury, possessing a whole rookery of photographers, there is necessarily much competition, and prices are miserably low, yet the public pay me of their own choice forty per cent. more for chromotypes than for silver prints, doing this not only because they are permanent but also because they are more beautiful.

A little practice is necessary to estimate the printing quality of the negatives and decide on the amount of exposure required; but this is soon obtained. We develope twelve *cartes* on a plate; and, as our rule is never to under-print, but to reduce, if necessary, in development with extra hot water, we come to the happy conclusion of not losing more than two or three per cent., and of having all the prints of such an equable depth of colour as cannot be managed with silver printing.

As to reticulation: I know nothing of it nowadays. I perceive that the Autotype Company's tissue is tougher, less liable in hot weather to run in streaks when drying, and in several ways improved, and the present absence of reticulation may be due to this; but I have always differed with the Company's theory of the cause of reticulation, and feel sure that rapid drying has nothing whatever to do with it. Still, as reticulation is a fault that appears to belong only to the past, it is not worth further discussion.

For the summer weather I find my suggestion of placing the bath solution in Winchesters, wrapping a wet cloth round them, or allowing a stream of cold water to trickle over them for a couple of hours, reduces the bath to such a temperature as makes sensitising quite safe. I hold, also, strongly to my expressed opinion to sensitise over night, and only for the next day's consumption. I know thus exactly what I am about and what to expect. If I chance to sensitise rather more tissue than is wanted in the day I simply throw it away, which I find to be the cheapest course.

Now, of the two items of information that I wish this communication to convey, the first point is very simple, and perhaps is more applicable to beginners. It is simply that when developing, and as soon as the paper has peeled off from the pigmented gelatine beneath, allow the plate to rest in the water for at least two minutes. The picture developes itself and gets intensity, and the danger of washing away some of the half-tone by the immediate lavement with hot water is wholly avoided. This is but a simple point, but I have known many beginners arrested at this stage by imperfect pictures, the cause of which I believe to be here stated.

My second point is, I consider, of great importance, and the statement of it will bring me a little in collision with the authorities at Ealing Dene. There was a time when I bowed humbly to the instructions of Mr. Foxlee, and have taken quietly several raps over the knuckles from Mr. Sawyer; but I am so satisfied with the results of my own observations that I am not the least afraid to challenge an issue upon the point in question. This point is that the instruction in the *Autotype Manual* for preparing the sensitising bath by adding to one ounce of bichromate thirty ounces of water is a mistake. This bath is too weak, and its use is the parent of a fruitful crop of difficulties. Of course I may be wrong, and I stand open to correction; but I never rush into print without carefully repeating my experiments over and over again, and this experience tells me that twenty ounces of water is the most that should be added to an ounce of bichromate. I consider this the *maximum*, and my practice varies from one in eighteen to one in twenty. I say that the feebleness of the image, the washing up of high lights, and the loss of detail, which bother photographers in carbon printing, are almost entirely due to the weakness of the bath.

I am not chemist enough to say if the rule which gives a more vigorous silver print in a strong silver bath holds good in the bichromate bath; but I am quite practical man enough to know that the bath to ensure good results and to avoid a host of difficulties is the strong bath as indicated above. I have very recently had a discussion with Mr. Foxlee on this point, and have seen numbers of chromotype specimens done by the Autotype Company, and I say that from the same negative in my strong bath I will get better results. I do not want to belong to the argumentative class, although I elect to stand up for my own opinions. The case is in a nutshell, and I advise chromotype and carbon printers to try the strong bath instead of the weak one, and I think they will acknowledge that I have given a very useful and excellent piece of advice.

When I reflect upon the absolute inexperience from which I started I am surprised at my own success. Before I went to the Autotype Company's works I had never touched carbon. When I got there it was a day of terrific storm, and I felt half dazed with the novelty of the operations. However, I went home and tried, and tried, and tried, and at the end of a month I said to myself—"I am done. This chromotype will injure my health, spoil my temper, waste my money, and block up my business; I had better give it up!" However, no! I thought I would have another trial, and in a fortnight after things began entirely to alter. My impression now, as a man of business, is that the investment for a licence was the best photographic day's work I have ever done. It has increased my business and added to my profits. It has led me to open a branch at Warminster, which at once succeeded, owing to good permanent work; and I have, further, from my full persuasion in the matter, ventured on a considerable contract with the Autotype Company, and mean to push chromotype into fresh districts.

I hope that my remarks may aid my brother photographers, and encourage the feeling that our work *may* be made permanent.

C. J. Witcomb.

GELATINO-BROMIDE.

Having tried Mr. Wratten's method of making gelatine emulsion, I have not quite succeeded to my satisfaction. The emulsion seems very thin, and takes a long time to set. I have not experienced any difficulty in dissolving it. I have just tried again, and this time it has set in a reasonable time; but I do not like the plates so well as those I am in the habit of preparing in the old way, and, after all, there does not seem to be any real gain. I have saved the alcohol and water from several batches, and it is now quite clear and bright; but at the bottom of the bottle there is a quantity of gelatine, so that if we let the emulsion rest, after adding the third, long enough to get all the gelatine it would take quite as long as to wash it in the old way, and I can wash an ounce of emulsion in two hours.

If any one will try either of the following I do not think they will need to search much further, and I think they will be pleased with the negatives obtainable:—

No. 1.

Gelatine (fine cut)	20	grains.
Bromide of ammonium	11	,,
Methylated spirit	½	drachm.
Golden syrup	½ to 1	,,
Nitrate of silver	20	grains.
Distilled water	1	ounce.

Place the gelatine and bromide in the bottle, and pour on about two-thirds of the water; let soak (if you use the fine-cut gelatine ten minutes will do), dissolve, and add the silver in half the remaining water, in about four lots, shaking well after each lot. Then wash out the silver bottle with the rest of the water, pour in the spirit, and turn the bottle about to mix it; then pour in the golden syrup, shake well, and wrap up the bottle in black cloth.

No. 2.

Fine-cut gelatine	20	grains.
Bromide of ammonium	11	,,
White sugar	10	,,
Nitrate of silver	20	,,
Distilled water	1	ounce.

Place the gelatine, bromide, and sugar in the bottle, and pour on two-thirds of the water; let soak, and dissolve. Then add the silver as above, wrap up the bottle in black cloth, and set it inside the fender in front of the fire for several hours (I give it five or six hours), shaking occasionally; then pour it out to set in a dinner plate, and it will be firm enough to place in the wash water in one hour. Have a conical hole drilled in the centre of the plate, put a string through with a knot, draw the knot well into the hole, and cement it with shellac or sealing-wax. Have a pan large enough to take the plate in when stood edge downwards on the bottom; fill the pan with water, sink the plate edgeways, and then raise it up by the string till just under the surface of the water, emulsion side downwards. Lay a flat stick across the pan, tie a knot in the string about two inches from the back of the plate, cut a slit in the stick, and put the string into it, the knot keeping it from slipping through; cover all up, and let remain from two to six hours. To the last ounce I made I gave two hours, and the plates are all right, though not so sensitive as I have had. When washed empty the pan, and stand the plate on edge to drain; dissolve over hot water, and pour through a calico filter into the pouring bottle.

Develope with three grains of pyro. solution to every two drachms, of which add two or three drops of the following:—

Liquid ammonia	30	minims.
Bromide of potassium	20	grains.
Water	½	ounce.

I always flow the plain pyro. over the plate first, letting it soak in while I put three drops of the alkali into the glass; pour off the pyro. into the glass, return the whole to the plate, and keep it moving about until dense enough. The treacle plates become sufficiently dense with the first batch of developer; the sugar plates generally require a few drops extra of ammonia solution.

G. Morton.

AMATEUR PORTRAITURE.

Portraiture, as a rule, is not much practised by amateurs—not, at least, to the same extent as landscape work—and many, I daresay, never attempt anything of the sort from one year's end to another. It may be that experience has proved it to be an unprofitable and unsatisfactory pursuit. So, at anyrate, it has been in my own case, for I have found that my sitters exhibit a much higher appreciation of my imperfect efforts in that line than they would have done had I been a professional; and, however pleasing it may be to find your labours receive a due (or undue) amount of appreciation, it is somewhat unsatisfactory, to say the least, when the demand for prints runs to three or four dozen from a single negative, with no visible *quid pro quo*.

There is, however, another reason which may be urged in explanation of the neglect of portraiture. I number amongst my photographic acquaintances many who, though equipped to take the field at the shortest notice with dry plates, would be sorely puzzled if called upon to execute a friend's portrait, or, better still, that of the latest addition to his family circle, simply because they have no silver bath available for the purpose. A good deal has been written lately on the subject of emulsions used wet, and it has been stated that when so employed they are, at least, as rapid as ordinary wet plates; but the idea of applying an organifier appears to be sufficient to keep that method out of use. It may be interesting, then, to some of my fellow-amateurs if I inform them that no organifier is necessary, nor any special emulsion. The ordinary emulsion used for dry plates (no matter how prepared) may be employed, the only difference in manipulation being that instead of drying the plate it is rinsed under the tap, as soon as set, until all the volatile solvents are removed, and then transferred at once to the dark slide for exposure. The time required to impress the picture is so short as to bring such plates quite within the range of portraiture, though the sensitiveness is not so great as when special means are adopted to promote it; but even without such special means I am inclined to believe that wet emulsion is very little, if at all, inferior to ordinary wet plates in rapidity. I have within the last few weeks produced portraits, fully exposed, in from seven to twenty seconds with an ordinary half-plate lens (not by any means a rapid one), the time generally being late in the afternoon (from five to seven o'clock). This was in the open air; but it does not necessarily follow that that is anything in favour of rapidity, and I am strongly of opinion that had I used the bath I should have been compelled to increase the exposure.

As I have already said, the only variation in the preparation of the plates consists in washing them instead of drying; but a different course of treatment is necessary in development. The delicate shadows of the face are so easily brought into too great prominence, that if the ordinary method of development be followed the result will be similar to that arising from under-exposure. If the exposure be increased in order to subdue the shadows the inevitable result will be that in getting sufficient density in the lights the shadows and half-tones become entirely filled in, though before intensification the image may present a harmonious yet vigorous appearance. Two or three months ago, while trying wet emulsion against bath plates in the studio of a photographer of some standing, I experienced this difficulty—that though giving exposures twice as long as the wet plates I could produce only harsh results, wanting in harmony, and having all the appearance of under-exposure. The fact was, I was really over-exposing; but, using the ordinary dry method of development, the image flashed out almost instantaneously, and I was compelled to wash off the alkali before the details were out in order to save the rest of the picture. Another point to be borne in mind is that with these wet plates there is less latitude in the matter of exposure than when they are dried; hence a slight variation, on either side, of the correct time will prove quite as injurious as in the case of wet plates prepared with the bath.

The principle to be followed consists, first of all, in judging the exposure as nicely as possible, which is not a matter of so much difficulty as in landscape work; then proceed in such a manner as to bring out the details in the shaded portion of the face as rapidly as possible without giving too much density to the high lights, and as soon as the detail is obtained proceed to intensify *with silver*. If the alkaline developer of ordinary strength be employed this is quite impossible, as it gives too great contrast for the proper rendering of the flesh tints; it must be modified in something like the following manner, though, of course, the exact formula will vary with different emulsions:—Let the solutions be pyro. half-a-grain to the ounce of water, bromide five grains to the ounce, and ammonia one part in seven. Commence by flowing the plate with sufficient of No. 1; then add, to each two drachms, one drop of No. 2 and three or four of of No. 3. The image should come up as rapidly as an ordinary bath plate, but very faint. If the detail hang back at all add a little more ammonia; but do not, under any circumstances, attempt to gain density with the alkali. As soon as the requisite amount of detail appears, forming an apparently flat, weak picture, wash and intensify with silver, when it will be found that the most beautiful gradations may be obtained in the face, combined with vigour in the remaining portions of the picture. A softness and roundness is thus obtained which cannot be excelled, even under most favourable circumstances, by ordinary wet plates.

One thing must be carefully guarded against—over-intensification. The appearance of these emulsion films is even more deceptive in the case of portraits than in landscape negatives; and what, compared with an ordinary portrait negative, seems thin and feeble may, perhaps, be found to require a very long time to print, and to give a flat, tame result.

I have not written this article in the expectation or hope of converting the profession to my view, nor are my remarks intended for those amateurs who are already *au fait* in emulsion work, but simply for those who have not yet tried the wet emulsion process, or, having tried it, have failed. I am sure this adaptation of emulsions must eventually come into general use—at least amongst amateurs; but, in the case of professionals, it involves so complete a revolution in their system of work that I fear it will be long ere it makes headway in that direction.

W. B. Bolton.

ON PRACTICE AS APPLIED TO THE "GRANULAR THEORY."

Having had occasion lately to boil down a silver bath, I took the opportunity of making a series of baths of various strengths, in order to test the capabilities of the plates prepared therewith. Broadly speaking, I may say that the results support my theory that coarseness is accompanied by extra sensitiveness, although a few of my results have been rather of a negative than of a positive character.

I have used baths varying from ten, or even eight, grains to eighty grains per ounce; and I may state the physical peculiarities generally thus:—The result depends a great deal upon the character of the collodion and upon its "salting;" but, generally with a bath of ten grains, or less, the silver bromide forms in large patches and then breaks entirely away from the collodion film, leaving merely small patches here and there.

With a bath of about fifteen grains the bromide is also formed immediately, but it does not in this case break away from the film. A thick, opaque coat is quickly formed; indeed, the whole of the soluble bromide appears to be converted in almost as many seconds as it would take minutes in an eighty-grain bath. From this strength to twenty or twenty-five grains the results are somewhat the same, except that, curiously enough, a more irregular film is formed, generally marked by "smears" in the direction of the flow of the bath (a flat bath being used), and sometimes by a reticulation or "crapiness" of the film; the plates are, also, not so opaque.

A bath of from twenty-five to thirty-five grains is apt to produce an extremely fine film (or else to form very little bromide; I incline to the former opinion, for reasons I shall hereafter state). A stay of many hours in the bath does not increase the opacity of the film.

A bath of from forty to fifty grains gives a fine film of somewhat increased opacity; but a long immersion in the bath does not produce so rich a film in appearance as a strong bath does.

With baths of from sixty to eighty grains the results are not so marked; they seem to depend more on the duration of the immersion of the plates in the bath, the stronger bath doing its work more quickly.

As to the colour of the various plates by transmitted light: I may say that the films on which the bromide breaks out on the surface, whether it partially breaks away or not, are of a coppery-red colour when wet, and ruby-red when dry.* This result is different to what I should have expected. The finest, or most transparent, films are of a light yellow colour; sometimes the film will transmit nearly all the rays of a candle. The films prepared in the baths of medium strength are of a deeper yellow; and those prepared in the strong baths are of an orange tint.

Perhaps it may be as well, before I go on to state the more chemical results, to make a few remarks on the evidence to be deduced from the physical peculiarities of the films I have tried to explain. If we say, as I have myself done in former articles, that a ruby tint is the characteristic of a fine film, how can can we account for bromide, which is formed quickly on the surface of the film, being of this colour? Surely the circumstances of the case point to a necessity for the formation of a coarse film. If so, how little can we deduce from the colour of a bromide film! In only one case was anything like a blue or green effect produced.

I now come to the trial of the plates for sensitiveness. I proceeded as follows:—All the exposures were made to the light of a petroleum lamp under a quarter-plate, having strips of *papier vegetal* from one thickness to twelve attached to it, each layer nearly doubling the exposure necessary to produce the same effect on the underlying bromide as on that under one layer less paper. Each batch of four plates experimented on were exposed one after the other at the same distance from the lamp for the same time, and were then developed together in a bath of the hydrosulphite of soda developer of half the strength I usually employ. I have omitted to state that the plates were generally left for one hour in the silver bath, whether the latter were weak or strong, and that the plates were then washed and dried spontaneously, no organifier being used.

I have had somewhat conflicting results in several ways; but they generally indicate that coarseness, or some state concomitant with it—it appears important to note the latter possibility—is favourable to sensitiveness.

The coarse films, as a rule, developed much more quickly than the fine ones, thus supporting my statement in a former article, though sometimes the development has appeared to proceed at the same rate in each case—that is, to begin at the same time; at other times nearly all the effect has been produced upon the coarse films before the development commenced upon the finer. In no case was the converse noted.

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* I find that I must modify this statement, as I have since observed that a film from which the bromide had partially broken away gave over the greater portion of the opaque bromide, remaining a blueish-green by transmitted light. Where a thin, irregular coating of bromide remained, after a part had broken away, the bromide was of a more transparent copper colour. Now the question is whether the "green" colour is caused by coarseness or by some other state of the bromide.

Perhaps the most sensitive film of all was one made from a not very good sample of ammonium-bromised collodion sensitised in a bath of a little over twenty grains. This was very reticulated, and utterly worthless for any other purpose than experiment. Compared with a plate prepared in an eighty-grain bath with the same collodion it was about four times as sensitive. As a rule the plates were in the silver bath for one hour, whether the latter were weak or strong. I found that a plate sensitised in a thirty-grain bath was more sensitive than another prepared in a forty-grain bath, although in the latter case the plate remained fourteen hours in its bath, against the four hours' stay of the former plate in the weaker bath.

I think that I shall be more intelligible to my readers if, instead of particularising separate instances, I merely state the evidence to be deduced from my experiments, especially as everyone possessed of collodion and bath can try the matter for himself. I should be glad if some would adopt this latter course, as the addition of their experience would be most useful. As a rule, then, I may say that the weaker the bath the more sensitive will be the resulting film. I have had only one exception to this rule, and that was in the case of a plate sensitised in a bath of about eight grains.* The bromide burst out, and became detached from the film so quickly that I did not think it worth while to allow the plate to remain longer than the few minutes in the bath. There remained, however, after washing, a patch or two of bromide, and these were very insensitive. There are two ways of accounting for this insensitiveness: either that by reason of the short stay in the bath traces of soluble bromide remained, or that the state produced by the *excessively* sudden formation of the bromide is unfavourable to sensitiveness. Plates prepared in a strong bath occupy, in sensitiveness, a position between those made in baths of medium strength on the one hand and those prepared in weak baths on the other.

One of my experiments is interesting, as it seems to show that the soluble bromide may be converted in a very weak bath without giving an opaque film. One plate was placed in the eighty-grain bath during one hour, and then washed and dried. A second plate was placed in the same bath till "greasiness" had gone, then transferred to the ten-grain bath for one hour, and then washed and dried. On exposure the sensitiveness of each was the same. Now we can only account for this result by supposing that all the soluble bromide was converted in the second film, even though the ten-grain bath produced no visible effect on it; for neither was there increase of opacity nor any signs of breaking-out of the silver bromide. I had made the experiment hoping to obtain a "bursting-out" of the bromide, controlled somewhat by the preliminary immersion in the strong bath; but the result was not as I expected. All the evidence goes to show that a plate prepared in a bath of medium strength is insensitive because of the peculiarly-fine formation of the silver bromide; and that coarseness (comparative), whether produced in a strong bath, or, better still, because of the extra coarseness produced, in a very weak one, is favourable to sensitiveness.

It is necessary to remind my readers that these and my other experiments published, refer to the formation of silver bromide in the presence of excess of silver nitrate; coarseness under other conditions may not be conducive to sensitiveness. The Editors have suggested that possibly the bromide, in the presence of excess of silver and during a re-arrangement of the molecules, may, mechanically or otherwise, hold traces of silver nitrate. Altogether, as the evidence at present stands, I am only justified in stating my theory thus:—*Extreme sensitiveness is due to the manner of formation of the silver bromide, coarseness, or other state under special circumstances concomitant with it, being the most favourable condition of the film.*

It certainly appears that the late Mr. Sutton was mistaken—as I thought he might be—in stating that the "cloudy films" are insensitive. The reverse appears to be the case, so far as I am able to see.

Though I appear to have been right in my opinion, that a fine film may seem to be insensitive because of the prolonged development required, it would seem that I was only partially so; for a prolonged development with the fine films, or with the films prepared in the strong bath, does not cause them to develop to the same extent; neither will fresh developer cause them to do so. Either the development is effectually restrained by the fineness of division of the bromide—or, more correctly, by the vehicle containing it—or else some unknown concomitant of coarseness aids the light in its action.

I think that I have now made my position sufficiently strong to make it worth somebody's while either to combat my theory or, if he have no very definite views on the subject, to try whether his collodions, bath, and developer will produce the same results that I have arrived at.

I may say that I never make a very great pet of any theory; so that I shall not be offended even though mine get "a slap here, and a cuff there." If it be worth anything it will "alight on its legs;" if it be not, the sooner it parts company with its miserable existence the better it will be for its successor!

HERBERT B. BERKELEY.

P.S.—I think it necessary to explain that my letter published in the last number was not intended for publication, being a private letter to one of the Editors.—H. B. B.

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NOTES ON PASSING EVENTS.*

BY A PERIPATETIC PHOTOGRAPHER.

I OBSERVE that "evolution" formed a leading topic in the address of the President at the last meeting of the British Association. There is nothing in which evolution is displayed to such a degree of perfection as in the various processes of photography; for in them, more than in anything else, is it possible to trace with definiteness the various steps of the experimental ladder by which ideas at one time crude have ascended with ever increasing ratio of progress towards perfection. To what height photography is yet destined to attain it is difficult even to predicate; but, if the law and rate of progression be not suspended, it is not a great tax on one's imagination to conceive the possibility of obtaining photographs in all the gorgeous colours of nature, having a degree of permanence greater than many of such colours, and all this being effected by means so facile as to put in the shade even the practice of emulsion photography.

Of all the funny names in connection with photography which I have ever come across that of "poikilography" is about the funniest. While I have still the name before me let me express my astonishment at the avidity with which people make an inroad into the Greek language whenever they are hard up for a big, sonorous title. Why must the Greek invariably be laid under contribution when one requires to "name" a shirt, a pair of boots, a process, a tobacco pipe, or a new kind of photograph? Why not try the Gaelic, the Irish, or the Japanese languages by way of a change? Or, if still more originality were desirable, what do you say to the English language itself? Who was the daring man who first had the moral courage to give the humble yet expressive name "tintype" to a certain class of collodion positive taken upon blackened tinware, and to which various designations, including those of "melainotype" and "ferrotype," had been previously given?—who, I ask, was the bold man who kicked over the classic languages of Southern Europe in favour of that of the land of which Cornwall forms a by no means unimportant portion? But enough about names; let us come to things. I, as your "peripatetic photographer," in the course of my peregrinations, embraced an opportunity of inspecting a veritable "poikilograph," and I rather liked it. It reminds me so forcibly of a class of pictures that several years ago was, at repeated intervals, described and brought before the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY that I lost no time in going home and producing a poikilograph, or, at anyrate, a successful imitation thereof. Following the directions which had been long ago published, I rendered translucent an ordinary enlargement, and then painted it very strongly on the back, using for this purpose such powerful and bright colours as showed effectively on the surface. A few touches of colour (I used oil pigments) on the face of the picture completed my poikilograph; and I mentally recorded a vote of thanks to the late Thomas Sutton, or whoever it was that wrote up this process in days of yore. "Eureka!" I afterwards exclaimed, when I had placed (by single transfer) a carbon portrait upon a sheet of muslin prepared for architectural tracings, and had spent a quarter of an hour in painting upon the back. The effect is charming—the permanence undoubted; but I want a good name for my new process!—something neat and expressive! Let some kind-hearted philologist hunt among the living or dead languages of the various tribes in North or South America, Asia or Africa, and find some word equivalent to smooth, transparent muslin which will be made to answer as the prefix to the ever-recurring "graph," and I shall make over to him half the profits to be derived from our mutual invention; for I thoroughly acknowledge the potency of a good name. I at one time thought of immortalising my own name by affixing *it;* but assuming Dr. Phipson to be an authority as to what name my godfathers and godmothers kindly gave me, the title of *Jeremy-Dawson-otype* would, I am afraid, be considered slightly more sonorous than euphonious. And yet we are asked "What's in a name?" Much—very much!

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* This is the plate referred to in the preceding note. Is it possible that a "green" film is only sensitive when there are *fine particles of bromide* mixed with the coarse (green)?

* Continued from page 423.

Did my ears deceive me the other day when they conveyed to my brain the idea that an auctioneer knocked down the heliotype patents (three of them) for the sum of twenty-five pounds? and that Captain Abney's papyrographic patent (the property of that extinct company) found a purchaser for *five* pounds, although fifty pounds had been paid only last year to the patent office to impart to it another few years' tenure of existence? Surely someone got a bargain, using this term from the original-cost point of view. As to the merits of these respective patents they have been treated of so fully in former times that I need not here say anything regarding them.

It would be ungracious were I not to thank cordially Mr. Henry Cooper, Mr. J. A. Spencer, and others for their replies to my query respecting the edging of dry plates. Misreading, by the dim light in a railway carriage, Mr. Cooper's first suggestion, I applied an edging of solid paraffine instead of a *solution* of paraffine, and I found it to answer exceedingly well. Mr. Spencer's "cocoa butter" I tried also, and found it a very pleasant substance to deal with in this direction. At present I am employing the mixture of paraffine and india-rubber in solution, as recommended by Mr. Cooper. So far as I have seen it leaves nothing to be desired.

European astronomers must look to their laurels. The American fraternity, not content with making one of the greatest discoveries of the age, viz., that of oxygen in the sun, have almost capped this by making another discovery, namely, that our hitherto "moonless Mars" (as Tennyson writes) has no fewer than two satellites in attendance upon him, or *it*—whatever may be the gender of a planetary body. When to this we add that the "great Lick telescope" about to be constructed for California will, from its dimensions and scope, be expected to "lick" creation, including this country, nothing will remain for us but to meekly bow our heads and say that there is something more in America than "tall talk." Our feeling ought to be, and doubtless is, one of admiration rather than of envy.

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EXPERIENCES IN WORKING WITH DRY BROMIDE OF SILVER EMULSION PLATES.

The bromide of silver emulsion process is indisputably the simplest, most reliable, and most sensitive of processes, and the one that gives the best results. Generally the plates can be used without washing or the employment of preservatives. In the course, however, of the warm weather we had in June I remarked that plates which had been prepared for some time, and which had worked well when the temperature was lower, were no longer perfectly trustworthy, and I had difficulty in developing clean and brilliant negatives. Still, when these plates had a supplementary treatment with a preservative, they again became reliable, and the development proceeded easily and faultlessly.

A wet bromide of silver film obstinately repulses an aqueous preservative solution, and it requires several minutes' lively moving about in the preservative bath in order to get rid of the greasy marks from the film. Collectively the preservatives with which I experimented when applied to the wet film diminished the sensitiveness of the latter to light very considerably. Alcoholic solutions of preservatives are more easily used; but these also greatly impair the sensitiveness of the film, and the negatives are thinner. On the other hand, the behaviour of these same preservatives is quite different when used upon dry plates. In only a few instances was there any decrease of sensitiveness, and even in these cases it was so slight as to be scarcely perceptible; in other instances there was a contrasting increase. Of a whole series of preservatives with which I experimented the best results were given by egg albumen and gelatine (both when used separately and when mixed in equal quantities by bulk) and a mixture of tannin and gelatine. Many of the preservatives in ordinary use have their action improved by the addition of a little gelatine.

The following are the solutions with which I obtained the best results:—

1. Dilute some albumen with from eight to ten times its bulk of water; add glacial acetic acid until the fluid gives a slightly-acid reaction; shake up well; then, after letting it stand for ten or twelve hours until the liquid has become clear, filter through paper.

2. Take four hundred c.c. of water, thirty c.c. of glacial acet acid, and five grammes of gelatine. Soak the gelatine in a litt water; then dissolve in hot water, and, while still warm, add th acid.

3. Mix equal volumes of Nos. 1 and 2.

4. Dissolve two grammes of tannin in one hundred c.c. of wate then mix equal volumes of this solution and of No. 2. The mixtu will be milky and turbid, and after standing eight or ten days throws down a viscous, brown deposit. On the latter being filtere off the solution should no longer be milky-white in appearance, bu clear, and should also retain the peculiar smell of the tannin solutio

With preservative No. 4 very powerful, intense negatives ar obtained. Those got with Nos. 1, 2, and 3 are weaker. If th plates be slightly rinsed after the application of the preservative th negatives are invariably weaker than when the preservative is no rinsed off.

The treatment of dry plates with preservatives is quick and easy The dry film may be coated with a mixture of thirty c.c. of wate and ninety c.c. of alcohol, in order to soften it a little; then it may be rinsed with water until the greasy streaks disappear, after which the preservative may either be used as a bath or it may be poured two or three times over the plate. I recommend that after the application of the preservative the plate should be slightly rinsed with ordinary water, in order that the film may have a matt appearance when dry.

Any one who has gained some confidence in working the bromide of silver emulsion dry process, even although he has not worked it long, will place a high value on this process. If one would only consider the amount of baggage necessary for a photographic tour when wet plates are used, and the difficulties in their use caused by the heat in summer and cold in winter—not to speak of the disagreeableness of having to prepare these wet plates during summer in an apartment whose temperature resembles that of a Turkish bath—the dry process would be regarded more favourably than has hitherto been the case.

In conclusion: a few words as to the cost. A good emulsion must give a very thick covering, which in the wet condition should be opaque, and, therefore, must contain a great deal of bromide of silver. According to the proportion of this substance contained in the emulsion the value of the latter is calculated. Plates prepared with emulsion I consider cheaper than ordinary wet plates for the photographic tourist, if in calculating the value of wet plates one makes a due allowance for the cost of transport and for the chemicals wasted. The quantity of bromide of silver emulsion required for the preparation of plates is, on an average, one cubic centimetre of the former to fifty-eight or sixty square centimetres of the latter. I may also mention that bromide of silver dry plates are excellent for transparencies, either for the production of enlarged negatives or to be used as dissolving views. These plates are also very suitable for reproducing oil paintings, especially when the exposure takes place in a museum or other building where the original may not be removed from the place where it hangs. Fr. Wilde.

—*Photographische Mittheilungen.*

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THE ART OF PAINTING UPON THE PHOTOGRAPHIC IMAGE.

No. III.

I do not think it is within the scope of these articles to enter into an attempt to teach drawing; but I will once for all say that it is as necessary to be a draughtsman in order to complete a first-rate picture on a photograph as it is to paint one without. No doubt a certain method may be acquired of making a photograph—especially if it be a good one and contain nothing much besides the face—look pretty and pleasing; but if really valuable work is to be done a thorough knowledge of drawing is absolutely needful—there is so much often to be improved, omitted, substituted, and introduced. The hands, particularly, require study—they so rarely "come out" naturally in a photograph. The eyes are especially worth studying from nature, noting how the light strikes the eye, causing that white spark of light; also how the light goes through the iris, illuminating it softly round the opposite side of the pupil, and how that becomes lost in darkness as it approaches the upper eyelashes. The white part of the eye will often be found too white, and will generally want shading.

If the student can manage to stipple with a kind of rounding effect, as if he *felt* the way, the muscles go all the better; or for large work he may even-up all over, and then boldly cross-hatch with broad, soft strokes, as he will see in a good engraving.

In the matter of brushes the student for water-colour and black d white work will require two each of No. 1 and No. 2 red sables, e of No. 6, and a large camel's-hair brush for washes. The three rst sizes had better be in albata mounts with ebony handles, as ose in quills are apt to split.

As regards colours, the following will be found sufficient for every urpose:—Vermilion, crimson lake, scarlet lake, burnt carmine, dian red, Venetian red, dragon's blood, Rubens' madder, indigo, russian blue, French ultramarine, gamboge, Roman ochre, Indian ellow, raw sienna, terre verte, Emerald green, Vandyke brown, urnt umber, raw umber, ivory black, neutral tint, sepia, orange hrome, and, lastly, a set of flesh shadow tints, Nos. 1, 2, and 3. he last three tints are, as far as I know, only made by Messrs. arnard and Sons, Oxford-street, London. These gentlemen also ake three tints of flesh colour suitable for fair, medium, and runette complexions, and, although I do not use them myself, they ight be found of use to others; they are certainly very ready, and ill represent what they are intended for. A bottle of Chinese hite, a bottle of strong gum water, and a sharp scraper will complete he outfit for a beginner, with the addition of a palette. The craper must be very sharp and well-tempered; a surgical scalpel I ave found answer the best.

Now take a good albumenised print or autotype (if the latter see f there are any passages that would be better for being lightened); ake clear white high lights, if requisite, with ink-eraser; and take ut all black spots.

Now for the face. Take a mixture of vermilion, rose madder, nd raw sienna; this may be made to do for any complexion, ccording to the *proportion* of ingredients used. Float a suitable wash of this over the face, and if, whilst wet, a little rose madder with a touch of vermilion added to it, be dexterously flooded in on each cheek, it will, if properly done, save some time and trouble afterwards; also, whilst the general wash is wet, the high lights on the forehead and nose may be taken out with a *dry* brush. This first wash is, I think, better without gum, because it represents the lights of the face, and, by keeping it dull and the shadows transparent and gummy, you get an effect analogous to the impasto and glazing of oil. Another reason is that it covers or hides the photograph a little more.

JOSEPH WAKE.

HERR WILDE'S DRY-PLATE PROCESS.

THE possession of a trustworthy dry-plate process that should not be subject to the drawbacks which have as yet always accompanied dry processes has long been an unsatisfied desire of all photographers, but especially of amateurs. These drawbacks were—first, the great length of exposure required; and, secondly, the difficulties presented by the process of development, which generally (at least in the hands of the less experienced) hindered the further use of these plates by forming the so-called dry spots on the negative. Herr F. R. Wilde, of Görlitz, has, by extensive trials and judicious combinations of the various methods in general use, so improved the existing processes that without exaggeration one may say the object has been attained—we have got a genuine dry process by which landscapes, views of interiors, or of scientific objects may be secured.

The length of the exposure has been considerably shortened in so far that a well-lighted lens only requires from twenty seconds to two minutes to produce a powerful negative, having all the half-tones and finer details well brought out. For interiors a longer exposure—say from fifteen to thirty minutes—would be required; but, the plate being dry, that is of less consequence. Wilde's dry plates are prepared with an emulsion of collodion and bromide of silver.

According to Herr Wilde's directions, the side of the plate to be prepared with emulsion should be previously furnished with a substratum consisting of a solution of one gramme of caoutchouc in 150 to 200 grammes of benzine. When the substratum is dry the emulsion is poured on like ordinary iodised collodion. The plate is then dried, when the film has stiffened somewhat, by being moved about over a sheet of iron under which a spirit lamp burns, so that the heat may reach the film but not the light of the flame. When dry the plate is ready to be exposed, and may either be used at once or stored for future use. If the plate has to be used in very warm weather it is advisable to coat it with a preservative in order to prevent veiling of the film; but with a normal temperature bromide of silver emulsion dry plates require no preservative.

Of all the preservatives tried by Herr Wilde the mixture he calls "No. 1" gives the best results. But when he wishes to diminish somewhat the sensitiveness of the plate, and to obtain powerful, well-covered negatives, such as are required for reproductions and architectural subjects, he uses as a preservative that called "No. 4" in his article, and consisting of a solution of two grammes of tannin in one hundred c.c. of water.*

Herr Wilde only recommends these preservatives for use in hot weather; but I may remark that I have several times used these plates when the temperature was very high, and found the preservatives unnecessary. I have also taken landscapes with these plates, some of which were prepared by Herr Wilde and some by myself according to his directions, and, though no preservative was used, the negatives were always clear. These negatives were developed with a mixture of—

Alcohol	20	c.c.
Distilled water	5	,,
Bromide of potassium solution (five grammes of bromide of potassium to seventy-five c.c. water)	10	drops.

With this mixture the exposed plate, which may be developed long after the exposure, is coated, and the action is allowed to proceed for a couple of minutes, after which the coat is rinsed off and the water carefully allowed to flow over it until all greasy marks have disappeared. When the plate has been thus thoroughly moistened, the following developing solutions are poured over it:—

A.

Pyrogallic acid	5	grammes.
Alcohol	25	c.c.
Distilled water	25	,,

B.

Bromide of potassium	5	grammes.
Distilled water	75	c.c.

C.

Gelatine	3	grammes.
Glacial acetic acid	20	c.c.
Distilled water	400	,,

D.

Carbonate of ammonia	25	grammes.
Distilled water	150	c.c.

The carbonate of ammonia should be ground very small, and very compact pieces should be chosen; the water used for dissolving it must be warm. Shortly before use the following quantities should be mixed:—

A	40	drops.
B	20	,,
C	10 to 15	,,
D	15	c.c.

While the pyrogallic acid developes the negative and brings out the details the bromide of potassium prevents the negative from appearing too rapidly, and also prevents fogging. The acid gelatine solution maintains the clearness of the image, and the carbonate of ammonia gives the necessary power.

The picture is fixed as usual either with hyposulphite of soda or with a weak solution of cyanide of potassium.

* * * * * *

In conclusion: from my own experience I can most warmly recommend Wilde's dry plates to all photographers as well as to those of my brethren who dabble in photography when pursuing their researches in the domains of art and natural science.

S. TH. STEIN, *Dr.*

—*Photographische Monatsblätter.*

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* The details of the preservatives are omitted here, as they are given at length in Herr Wilde's own article on preservatives in the present number. [See page 440.]

Our Editorial Table.

PAINTING ON CHINA, PORCELAIN, AND ENAMEL.

London: LECHERTIER, BARBE AND CO.

THE art of painting with enamel or vitrifiable colours. either upon a photographic basis or not, differs from painting in either oil or water colours, inasmuch as the effect of the latter is seen at once, while that of the former pigments is only seen after they have been exposed to a degree of heat that vitrifies them. Seeing that the production of ceramic photographs has now attained a high standard of perfection, and that however beautiful they may be in monochrome there will always be a demand for having them coloured, the manual of instruction before us, written by Mme. La Baronne Delamardelle (professor) and M. F. Goupil (figure-painter at the Sèvres Manufactory), and which is translated into English, will prove of much use in connection with the ceramic phase of our art-science.

Owing to the small number in the photographic profession embarked in this special department we do not consider it necessary at the present time to give any extracts from the sixty-three pages of practical details of which this manual is comprised; it is sufficient to say that face and figure painting, as well as flower, fruit, bird, and landscape painting, are all treated with as much fulness as the authors have conceived necessary.

This manual forms one of the shilling series so well known to every devotee of painting and drawing, and which may be procured at the principal establishments of artists' colourmen, the *spécialité* of the present *brochure* being the fact that vitrifiable pigments are employed.

These, we observe, are now prepared and sold in compressible tin tubes similar to those in which are contained the oil and water colours in common use.

◆

Dublin University Magazine.

London: Hurst and Blackett.

Of an equally successful character as the portrait of Mr. Tom Taylor, with which the August number of the *Dublin University Magazine* was illustrated, is that of Mr. Henry Irving, the popular tragedian, which forms the illustration of "Our Portrait Gallery" in the September issue of this old-established serial, which seems, thanks to energetic management, to have taken a new and firm lease of life. The portrait, cabinet dimensions, is from a negative by Messrs. Lock and Whitfield, who have secured an admirable expression in a photograph possessing singularly-perfect technical merits—merits of which the most have been made by the Woodbury Company, by whom it is printed.

The literary matter is fresh and varied as usual, the names of Mabel Collins, Dr. Keningale Cook, Ulick Ralph Burke, and Francis R. Conder being among the contributors to the present number.

◆

Street Life in London.—Part VIII.

London: Sampson Low and Co.

Mr. J. Thomson (for we believe we are correct in attributing the photographs specially to this gentleman) has this month been subjecting "Cast-Iron Billy," a veteran "whip," who, as a driver of varied experiences, from the box seat of the royal mail in quondam times down to his present humble position as an *employé* of the London General Omnibus Company, has been on the road, whip in hand, for a period of over forty-three years. "Billy" is represented as being engaged in gossip with a friend at the rear of the omnibus which he has the felicity of driving. *Workers on the Silent Highway* represents a familar scene on board of one of the numerous barges to be seen on the Thames. In the third picture, *Strawberries, All Ripe*, we have the lowly donkey cart of the costermonger, who enacts the useful part of general purveyor to outlying suburbs of London, the inhabitants of which, were it not for these nomadic merchants, would be deprived of several seasonable dainties now brought within their reach.

Correspondence.

Photographic Art in America: Its Professors, Its Value, Its Uses and Abuses.

Thanks for suggestions. I well know that our age is abundantly prolific of invention and discovery in all departments, be it the ornamental or the useful, and mankind are also now proverbially covetous of the new.

In no sphere of art has there been more rapid progress, or a greater multiplication of discoveries or novel and interesting varieties, than in the art of sun painting. This art, too, is in all its phases so opulent of beauty and wonder, and every new form that makes its appearance as the result of the sun's handiwork is so attractive and meritorious of admiration, that we have no occasion for surprise that hundreds have rushed into it as a calling who are not gifted by nature with the requisite qualities to become successful and distinguished artists.

This is, however, only what usually occurs in all things, be they of great import or small. Men possessing artistic genius of a high order are rarely to be met with in the ranks of photographers in the United States. Yet some few such, I believe, are now fortunately in the profession; and, sooner or later, it is invariably found that the minds of men agree in putting individuals and their performances in their proper places.

Homer, Virgil, Shakespeare, Milton, and Dante have become our ideals among the poets; Alexander and Cæsar, Hannibal and Napoleon, Wellington and Grant our types of military genius; Michael Angelo, Raphael, Leonardo da Vinci, Rembrandt, Vandyke, Rubens, Titian, Sir Joshua Reynolds, Sir Thomas Lawrence, our Gilbert Stuart, Henry Innman, Elliott, &c., &c., are our representatives of the pictorial art; and so on to the end of the chapter.

To name our most talented and distinguished photo-artists of the present day in the United States, if not a difficult task, might possibly be injudicious, if not dangerous; therefore I forbear. The minds of our 40,000,000 people are, doubtless, rapidly expanding and constantly improving while they are grasping the new, the beautiful, and the useful; and the present novice in the art—the ambitious, talented, and rising photographer—will, or should, study and strive to imitate and endeavour to equal, if not surpass, the present acknowledged best artists in our land.

The sun painting art is destined to continue to grow in popularit through the heliographic sketches now becoming so common all ov the world. The most convincing evidences of this fact were to be see at our Centennial Exhibition, when the art was used in every co ceivable manner to illustrate and represent the thousands of wonderf exhibits and improvements of the age, and also the "counterfeit presentments" of the peoples of America, Europe, Asia, Africa, and th "isles of the seas" who visited our wonderful show. The vas numbers of photographs purchased by the crowds of visitors, many o them as illustrations of rare and valuable works of art, or as choic mementoes of the Centennial, will serve to leave instructive records i the drawing-rooms of the opulent, the intelligent, and the tasteful throughout all quarters of the globe. Thus were secured faithful copies of single objects; sections of interiors of buildings, rooms, and special exhibits; views of exteriors of buildings, grounds, &c., occupied by the numerous different nationalities, together with large numbers of views of spots famous in history, such, for example, as Egypt's Pyramids, and the ruins of her temples and cities, the reliques of the half-disinterred Herculaneum and Pompeii; in short, transcripts not only of the modern, but of whatever still survives of the empires, cities, and peoples that in ancient days and different countries filled the known world with their glory.

Through the same agency we are now able to obtain lifelike presentments of the countries and cities and populations, together with the costumes, fashions, and modes of life, of the modern world, as were so beautiful and copiously illustrated at our Centennial exposition.

The tendency of views of this class will be to educate, to elevate, and in all ways to improve the minds of the masses, and to furnish them with inexhaustible sources of innocent and, at the same time, edifying employment. The people at large, with their tastes and judgments thus cultured and refined, will naturally come to desire not merely truthful but artistically-finished portraits of their relatives and kinsfolk; nor will it be long ere they will be satisfied with nothing less than almost speaking likenesses and skilfully-made products of photography.

Hence it will follow that when heliographers in general shall show themselves true to themselves and their art, and shall have the camera managed by none but capable artists—who, by natural taste and judgment as well as acquired accomplishment, shall be qualified to pose every sitter and object artistically and with grace, so as to secure effective lights and shadows, bringing out in each face a thought-speaking expression—then our now, to a great extent, underrated and unappreciated art will secure its rightful honours, and will assume a high stand among those arts which are at once useful and ornamental.

At the present time, however, carpenters, cobblers, barbers, assistant cooks, and such like, who have not adequate capacity to thrive in their legitimate vocations, turn their attention to the science and art of photography, and, after spending a few weeks under the tutelage of imbeciles as devoid of genius and as ill-fitted to promote and elevate the art as themselves, set up as photographers, and in flaming advertisements promise to picture the "human face divine artistically" and "in all the beauty of nature." Such persons constitute four-fifths of the profession, taking flat, wooden, expressionless shadows of the crowd, and too many of them for a sum as low as a shilling or two each—trumpeting themselves, the while, as masters of the heliographic art, and disparaging and decrying legitimate, genuine artists who have studied and practically laboured for years to win a proficiency in their profession and to acquire a fair repute therein, and who with such aim have availed themselves of the advantages to be drawn from long study in the best art-schools of Europe. So long as such are the facts as regards our art in the United States, no wonder sun painting is looked upon by the more intelligent portion of the community, and especially by most of our old artists in oil, who are not sensible of its capabilities in the hands of cultured and capable experts, with distrust and contempt.

It is true that some few of this large proportion of the profession may have acquired a tolerable knowledge of the chemistry of photography; but a large majority of those engaged in the art at this day in our country are merely mechanical and chemical manipulators. Hence the slow progress made, and the present low condition and character of the art-science, in an artistic point of view, in the United States. But in the hands of a few skilful, faithful, and persevering men of genius and character, I feel confident it will rise gradually into favour with the old legitimate artists and connoisseurs, and with the better-educated portion of the public. Not this alone; but it will win, and deservedly too, the patronage of the community at fairly remunerative prices.

Philadelphia, August 27, 1877. M. A. Root.

◆

GELATINO-BROMIDE.

To the Editors.

Gentlemen,—The parents of an *only* child, even if it be an adopted one, are usually very jealous of its reputation. One would suppose that Messrs. Wratten and Wainwright are afraid of the reputation of their bantling, as my letter in your Journal called forth such an angry reply. What analogy Messrs. Wratten and Wainwright can find between making a pot of glue with boiling water and macerating gelatino-bromide at a temperature of 150° it is difficult to know, unless those gentlemen feel rather out of their element among the degrees. Beginners in chemistry do frequently get confused in this respect.

If the process answer, it is no doubt a great saving of time; but, to be of practical use, the films so made must equal in quality those that have been prepared by the longer process. This, of course, remains to be seen. If I have not succeeded in obtaining so good a result, others may, and I sincerely hope they will. But because Messrs. Wratten and Wainwright or any one else adopt it as a commercial speculation, I fail to see why this should be a reason for accepting a process as perfect until it has been proved by various and unprejudiced experimentalists to be so.—I am, yours, &c., E. D.

29, *Torriano-avenue, Camden-road, N.W.*,
September 10, 1877.

◆

THE BICHROMATE BATH.

To the Editors.

Gentlemen,—I note that your correspondent, Mr. William Weston, takes exception to the advice I tendered in my articles upon single transfer as to the non-use of a bichromate bath more than two or three times, especially if some period be allowed to elapse between the times of using.

I need not enter into details as to my reasons for this advice, which were fully given in an article I wrote for The British Journal Photographic Almanac for 1871. I would merely say that if Mr. Weston will reject his mouldy-smelling bath (query: may not this mouldy smell be due to the state of the interior of the stone bottle or of its cork) and use a fresh solution, the cost of which need certainly not stand in the way, his prints will not suffer by comparison with his former ones, perfect though he may hitherto have considered them.—I am, yours, &c., John A. Spencer.

September 12, 1877.

◆

GELATINO-BROMIDE.

To the Editors.

Gentlemen,—The thanks of gelatine workers are due to Mr. Wratten for the communication of his ingenious discovery, which I have tried with satisfactory results. In doing so I adopted Mr. Wratten's formula, and let the emulsion rest three hours. I then added methylated spirit till the milky fluid separated from the solid residuum, when I poured it off, prodded the gelatinous mass well with a glass rod, gave a final wash of distilled water, and, inverting the bottle, left it to drain all night. Next day I added sufficient coffee from the breakfast pot (previously filtered), with a few drops of extract of cocculus indicus.

The plates possess ample density, and require no bromide, though, from some cause or other, they had an orange tinge and frilled at the edges. I had no difficulty in dissolving the emulsion, and cannot account for any if the jelly be soaked in cold water and gradually warmed.

One great advantage of the process is that the plates set quickly. I notice, however, that Mr. Wratten says that a denser gelatine emulsion is formed by having bromide in excess. May I ask if this is the general opinion? In my own experiments I have rather found an excess of silver give density; though the opposite, I believe, holds good with regard to collodion emulsion.

I have also tried Mr. Bolton's method of precipitation, but, unfortunately, without success. Perhaps if I had adopted his formula I should have done better; but it seems extravagant to use thirty grains of silver and a proportionate quantity of salts to the ounce, when twelve or fifteen grains answer the same purpose.

I concocted my emulsion with bromide in excess, and the pyroxyline (in one case previously precipitated) separated entirely from the silver bromide. Could not something be added to the emulsion before precipitation to prevent this?—I am, yours, &c., W. Maxwell Jackson.

Hull, September 10, 1877.

◆

CO-OPERATIVE SUPPLY ASSOCIATION.

To the Editors.

Gentlemen,—Having been much amused by the perusal of the sonorous paragraphs of the prospectus of the Co-operative Photographic Supply Association, Limited, published in your issue of Friday last, I, as one of the superabundant middle dealers referred to, will, with your permission, make a few remarks thereupon.

That Colonel Stuart Wortley is an honourable man all will, no doubt, freely admit. He has ever—so it has been stated repeatedly—made it his practice to publish his ideas and inventions for the benefit of his co-workers. The highly-lauded uranium dry-plate process has been published, in all its details, over and over again—at least, so we have been repeatedly assured; yet we see, by this prospectus, it and the business of Messrs. Chambers and Co. are to be taken over by the new company at a valuation of £2,000. If the details of the said process have been published they are the property of the public, and are scarcely marketable. If, on the other hand, they have *not* been published, Colonel Stuart Wortley has not kept faith with the photographic community, and he who is faithless can scarcely claim to be considered honourable.

The company, or association, it seems, is to adopt the co-operative principle of selling goods at extremely low prices for cash. It is an axiom that he who would sell cheaply must buy in a cheap market. The company, it is to be feared, commences badly by proposing to purchase at £2,000 a process which is, at best, not superior to others, which is *no* secret, protected by no patent right, and which, even had it been a secret or patented process, has little intrinsic value in view of other processes already worked commercially. But what else could be expected of a limited liability association? Inordinate salaries paid to individuals irrespective of qualification; well-paid directors, highly useful as ornaments; property, otherwise a drug in the market, caught up in the heyday of commencement at the price of a first-class investment—these are the usual accompaniments of such associations, and shall I say invariably lead to success or failure?—I am, yours, &c.,

September 10, 1877. A Dealer.

◆

VARNISHING NEGATIVES.

To the Editors.

Gentlemen,—I see that "Varnish" asks a question as to "the best way to varnish a negative." It may not be amiss to give an account of one I invented for myself and found most successful.

I have a rectangular box made of tin, and in this box I have passages cut and a rectangular tube put in at a slight slope. The box is filled with hot water, and a lamp may be put underneath it to keep it hot. A negative is slipped into a tube and left till thoroughly warmed. It is then taken out, varnished, and put back. 150° F. will be a suitable temperature for the water.—I am, yours, &c.,

September 7, 1877. J. E. Gubbins, *Capt. R.A.*

◆

THE "PERIPATETIC" AS ADVISER-IN-CHIEF TO THE AUTOTYPE COMPANY.

To the Editors.

Gentlemen,—In your last week's issue the "Peripatetic Photographer," in a very kind and courteous manner, while acknowledging our position as autotype patentees ventures to warn us against granting exclusive licences, and to intimate his opinion that "now's the time and now's the hour" for us to bow to "the blind antagonism of the British photographer" to patent rights, and, throwing overboard all restrictions that may be supposed to hinder the universal adoption of carbon printing, to expect our reward by the firm rally of the profession around the autotype standard.

"Peripatetic" we think does very scant justice to the profession in supposing that any large portion of it desires either to evade or to circumvent the patents connected with carbon printing. We have not found this to be the case so far as our experience is concerned; on the contrary, the opponents of what we believe to be our legal rights may be counted on the fingers, and this hostility has been so totally unsupported by the great body of photographers as to be entirely unimportant.

The recent attempt of the Glasgow Photographic Society to organise some systematic opposition to the carbon patents met with the coldest possible response, for the simple reason that no one is really oppressed by the patent claims.

It is very widely acknowledged that during the last three or four years autotype has given a very welcome impetus to the trade in general by raising in some measure the status of the art; and our business relations to a very numerous body of clients, despite difficulties with tissue and delay in supply of enlargements, have been, with few exceptions, of a courteous and cordial character—founded, indeed, on the solid ground of mutual advantage.

"Peripatetic" falls short of his usual accuracy in supposing that we grant the invidious privilege of "exclusive" licences. Nothing of the sort; such a policy would be short-sighted and deserving his censure. We bought M. Lambert out of the field primarily to stop the sale by him of exclusive licences for his improvements on Johnson's system of double transfer, which exclusive action we discerned to be inimical to the interests of the trade in general and to the development of carbon printing in particular.

At the present time of writing we have 363 licencees on our books, comprising very many names of note in the profession, and carbon printing is making very steady progress both at home and abroad; but it is by no means free as yet from technical difficulties, and any sudden abolition of silver printing we have never anticipated. Perhaps if "Peripatetic" will consider with how much justice we could throw open the trade after taking the money of the 363 he will perceive that his advice was tendered without a knowledge of all the facts.

These gentlemen—our present licencees—would certainly have a word to say to us, and 363 would be as perplexing a number to the Autotype Company as it is at the present moment to the ministers of Marshal MacMahon. At all events we feel no impulsions towards perfect free trade. We supply autotypes to all comers on equal terms; but if any elect to produce the work themselves the conditions are not onerous, and the contract is only undertaken in the expectation of deriving a satisfactory return for the money. It is a pure question of business, and into the domain of trade questions of sentiment rarely enter. We are satisfied we should earn no man's gratitude by throwing open the practice of carbon printing; and, even if we did earn it, gratitude is a poor coin to reckon in a balance-sheet.

We have recognised the claims of all the early workers in carbon to a free licence, and have reason to think the process has made important advances since we have valued it more highly ourselves. Justice is the golden rule for business, and our notion is that, so long as we can supply the best materials, produce the best work, and offer to the trade the greatest balance of advantages, so long shall we maintain the position we congratulate ourselves to have achieved. When we fail to do this we shall deserve to fall into the background.

As "Peripatetic" has pointed out, single transfer will, next February, be without any restriction, and the market will be open for any and all to manufacture carbon tissues. We have anticipated this freedom somewhat by a recent contract with an eminent firm, lately advertised in your pages, which opened an independent market for the supply of tissue, and we shall not the least fear to meet the new conditions. We shall value our patents as long as they are worth anything, but we value much more the ability to grapple with photographic difficulties and to meet the growing needs of the art.

Although to have established an important and mutually-advantageous business in permanent printing is a good thing, to maintain it at a high level necessitates at least giving value for money. In business the palm is to him who merits it, more uniformly, perhaps, than in any other affairs of life.—We are, yours, &c., THE AUTOTYPE COMPANY.

September 11, 1877.

EXCHANGE COLUMN.

Four dozen stereoscopic views will be exchanged for a half-plate camera in good working order.—Address, M. R., at Mallinson's photographic depot, 124, Dale-street, Liverpool.

ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

NOTICE.—Each correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a *nom de plume* as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

REGISTRATIONS.—Next week.

J. A. P.—If the portrait be registered it will prevent its being copied in future, but registration will have no retrospective effect.

LIEUT. FAIRTLOUGH, R.A.—Received. Thanks. We shall in our next issue give a description of the shutter, by which time we shall have had an opportunity of trying it.

J. W. H.—If you call at our office, by appointment, any day next week we shall be glad to give you such advice as will be useful to you during your intended mission tour.

T. G. S.—1. The name of the lens is the "rapid rectilinear."—2. From an article in the present number you will observe that we have had an opportunity of examining the new lantern.

E. R. J.—Multiply the focal length of the lens by fonr, and the quotient will be, approximately, the length required for a copying camera in which transparencies are required to be printed on the same scale of magnitude as the negative.

JOHN COPLAND (Newlan).—What is the nature of the information you desire to have about your lens? You say it is quick-acting; that is an excellent quality. Has it any bad qualities to counteract this, that has led you to write respecting it?

J. LEWRY (Peckham).—Any draughtsman acting in the manner you describe lays himself open to an action for damages if the photograph so copied and sold be entered at Stationers' Hall. We cannot retain letters to be answered in specified issues of the Journal.

G. H.—You cannot hope to produce lantern slides by the Woodbury process, the special requirements putting this out of your power. But exquisite tones can very easily be got by the carbon process, a detailed description of the *modus operandi* being given in the *Autotype Manual.*

PHOTO. (Bermondsey).—If you can secure a copy of our ALMANAC for 1873 you will find in it precisely the class of information you desire. As it has long been out of print you must try and procure it elsewhere than at the office of this Journal. Should you call we can, however, afford you facilities for perusing a copy.

GEO. J. HENRY.—The front combination of your lens will answer quite well for taking landscapes of the dimensions you specify. The flat side must be turned towards the view, and a stop having an aperture of a quarter of an inch in diameter must be placed at a distance of two and a-half inches in front of the lens. The negative obtained under these circumstances will be sharp enough to bear being enlarged three diameters.

A. B. C.—1 and 2. A good deal depends upon the kind of paper to be employed, some samples requiring a slightly acid, and others a neutral, bath. Let the toning bath be slightly alkaline.—3. If we understand this question aright, the best material from which to make a negative for producing granular effects *a la* mezzotint vignettes is granulated paper of a moderately-dark tint, which can be obtained from those stationers who supply bookbinders' requisites.

D. O. Z.—If the photographer do not afford the youth an opportunity for acquiring an adequate knowledge of his art the latter would be *morally* justified in leaving. Whether he would be legally right in doing so or not depends entirely upon the agreement or engagement that exists. If you send us a copy of the agreement,, with a full statement of particulars, we shall consult a legal friend and let you know the result by private letter, if you enclose an addressed envelope.

B. LAWRENCE.—The distinctions have, with the demise of negative paper photography, quite ceased to exist. You may obtain any thin sample of plain non-albumenised paper and treat it in the same manner as if it were the Canson paper, about which you have been reading. The waxing may be performed after the negative has been developed and fixed. You are quite right; there is an analogy between the moist collodion process of the present day and the moist Talbotype sensitive paper of years long past.

L. O. SAMMANN (Paris).—Our correspondent would be glad if some reader would inform him whether there exists any publication containing practical instructions for the registration, by means of photography, of spectral lines, or, generally, trustworthy information on the application of photography to the spectroscope, and, if so, by whom published. In answer to another query sent by our correspondent, we reply that an article on the application of photography to surveying would be of interest to many of our readers.

W. W. (Ince).—We were unaware of the fact that "fossil oil" was present in whiskey, and hence could not give you a test for its presence. If, however, you mean *fusel* oil, one of the readiest tests is that of pouring a little of the liquid into the palm of the hand, rubbing it with the other until dry, and then smelling it. This is not a very scientific test, but it is one that proves reliable. If further information be required we recommend you to consult a treatise on the distillation of ardent spirits, of which there are several in existence.

D. A. PARTRIDGE (Philadelphia).—We thank our correspondent for two specimens enclosed in his letter showing what is being done with emulsions on his side of the Atlantic. In Philadelphia the practice almost entirely prevails of using a strong developer for wet emulsion plates, and our correspondent is of opinion that he gets a pluckier negative, with a better tone for printing, than when a weak developer is employed, even if the development is to be finished with acid pyro. and silver. The specimens are very successful.

L—— says:—"I shall esteem it a favour by your informing me if you see any reason why print-*washing* conducted as follows should not be as permanent as by any other treatment:—The prints, after toning, are washed in one change of water, and transferred to hypo. six ounces, water one pint. They remain in this bath for fifteen minutes, with continual turning to avoid air-bubbles. From this they are placed in a *large* dish of water, drained, and refilled ten times. They are now put one by one on a dish, bottom up, and the tap turned on to them, and 'sponged' face and back with a good handful of cotton wool, and finally washed in running water for half-an-hour *only*. I believe this is a much shorter wash than is usual, but should not the sponging make up for a good deal?—If your correspondent 'Varnish' will try a hot-water tin and Bunsen burner he will experience no trouble with varnishing."——In reply: If prints fade after undergoing such washing as that here described it will arise from some other cause than the presence of hyposulphite of soda. But an ordinary sponge would be preferable to a handful of cotton wool for use in sponging the prints.

IN TYPE.—Articles by G. W. Webster, F.C.S., John Nicol, Ph.D., and other contributors.

☞ Editorial Communications should be addressed to "THE EDITORS"—Advertisements and Business Letters to "THE PUBLISHER"—at the Offices, 2, Yor Street, Covent Garden, London, W.C.

METEOROLOGICAL REPORT.

Observations taken at 406, Strand, by J. H. STEWARD, Optician.

For the Week ending September 12, 1877.

THESE OBSERVATIONS ARE TAKEN AT 8.30 A.M.

Sept.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks
6	30·04	W	50	55	69	45	Bright
7	29·84	E	51	56	65	50	Hazy
8	29·97	E	49	56	63	47	Cloudy
10	29·92	NE	55	57	61	52	Fine
11	29·83	S	59	63	70	55	Fine
12	29·87	WSW	60	63	—	57	Fine

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 907. Vol. XXIV.—SEPTEMBER 21, 1877.

MORE ABOUT DRY-PLATE SPOTS.

Since writing on this subject last week we have continued our experiments with a view, if possible, of further elucidating the matter by tracing to their source the various descriptions of spots which are met with in ordinary practice; in doing this we have examined the effects produced by different substances of a more or less active nature when present in or on the moist film in the shape of dust. It has long been a matter of belief that the various sorts of spots, whether minute or the opposite, opaque or transparent, take their origin from the one source—dust; but it must be obvious, in view of the great diversity in the forms of the defect, either that the action of the dust is subject to much variety, or that the conditions under which the spots are formed exert a considerable influence upon the result.

We have shown in our previous article that one condition at least is extremely favourable, if not to the formation of spots, at least to their further development to a stage which is not attained when that condition is eliminated, namely, the presence of moisture in the film, and that in proportion as we increase the period during which that state of affairs is allowed to exist so will the evil effect be more marked. We made the application of this principle solely in connection with the length of time allowed to elapse before the thorough desiccation of the plate after preparation; but it is evident that the same rule will hold good should moisture attack the film after drying, as in the case of plates badly stored in a moist atmosphere. We mention this because we notice that a writer in our columns has recently stated (see page 424) that spots are to be avoided by using the plates as soon after preparation as possible. This we are prepared to admit in the case of badly-stored plates, because it is next to impossible to entirely protect the film from dust during the process of preparation, and, the inducing cause being present, even the slightest amount of moisture contained in our ordinary atmosphere would prove sufficient to develope its effect. But, given a film originally well and quickly dried and subsequently protected from all atmospheric action or moisture, we hold that the defect in question will be reduced to a minimum, if not entirely obviated. In this respect the dictum of the writer referred to does not differ from what we have already stated.

In the course of our experiments we have endeavoured to identify the special character of the spots produced upon slightly-moist films by various substances in a state of extremely fine division. In speaking of moist films in this connection, we do not refer to those which are purposely kept moist by the application of a hygroscopic preservative, such as sugar or glycerine, but to those prepared in the ordinary manner and allowed to dry within a reasonable time. Curiously enough, the effect of dust in producing a deleterious action over a large surface, as in the formation of circular spots, is much less noticeable on the films purposely kept moist for a prolonged period, just as it is more seldom met with when the plates are washed and treated with a preservative than when a washed emulsion is employed. This may be, and we believe is, due to the restraining action of the preservative or organifier, for under no other supposition can the phenomena be explained; but, at the same time, we do not wish it to be inferred that the use of an organifier is sufficient to secure immunity from *minute* spots or specks—the immediate effect of the contact of particles of foreign matter with the sensitive surface.

We start, then, with the hypothesis that spots are the direct or indirect outcome of dust; but what is dust? An eminent statesman has defined dirt as "matter in the wrong place;" for all practical purposes the same definition may be applied, photographically, to dust, for it is, undoubtedly, matter *of some sort* "in the wrong place." But for our purpose it is necessary to analyse the effects produced by different descriptions of dust; and this we have attempted to do by proceeding synthetically, as it were, to the production of various forms of spots by the application of dust particles of varying composition.

Without attempting to analyse the somewhat complex character of the dust floating in an ordinary atmosphere, we may call attention to the probability of a much more dangerous action on the part of the floating particles on the atmosphere of a photographic laboratory. However carefully the operations may be conducted, however assiduously the place may be cleaned, the danger cannot be wholly removed; indeed the very act of cleaning most probably only tends to its increase. Thus: suppose a few drops of a solution to be spilled upon the work table—a by no means rare occurrence in photographic operations—the solution is absorbed into the pores of the wood, which thereby becomes impregnated with a variety of active matter which, under the action of scrubbing or dusting, is set floating in the atmosphere in the form of "dust." While not supposing that in a well-ordered laboratory such substances as pyrogallic acid, tannin, carbonate of ammonia, or bromides will be found floating "to any great extent," as Bret Harte has it, we have thought proper to try these and several other agents which, at least, have a place on the shelves, and are therefore not above suspicion, and we shall give, as briefly as possible, the effects of some of the principal.

We commence with pyro., which, from the combined facts of its being in such frequent use and its light and powdery nature favouring the formation of floating particles, forms one of the most dangerous substances with which we have to deal in this connection. This character is, indeed, so well known that many wet-plate workers refuse to give it a place in the operating room in the dry state. Though not likely to produce such disastrous results upon dry plates containing no free silver as upon wet ones, it did seem to us that we could consider it altogether innocuous, and in practice we find it results in spots of stronger development or greater density, varying in area with the length of time occupied in drying the film after the contact. These spots rarely, except in a well-lighted portion of a picture, reach complete opacity, being denser in the centre and gradually shading off to the edge; no nucleus is visible, unless the darker centre may be so described. Gallic acid gives a somewhat similar but much less conspicuous result. Tannin, which might be supposed to behave in a similar manner, exhibits totally different characteristics, though we are unable to individualise any particular form of spot as belonging specially to it. A good sample of tannin which we have used for some time with success gives three distinct forms of marking—first, and most numerous, a black opaque spot varying in size from a mere speck to an eighth of an inch in diameter, and of irregular, though generally nearly circular, form with ill-defined edges; second, a transparent circular spot varying in size and with sharp clean outline, but no nucleus; and, third, a similar marking, but with an opaque, clearly-marked circular nucleus, entirely different from the nucleus of washed emulsion spots. Tannin is a somewhat complex substance and liable to various changes, hence, perhaps, these different results. All three forms of spot will appear upon the same plate.

Carbonate of ammonia gives a spot somewhat resembling that obtained with pyro., but with a semi-translucent appearance, approaching the effect of solarisation. Other carbonates differ in effect only in degree.

Soluble bromides give markings plainly visible (upon washed emulsion plates) before exposure, and varying in size according to the bromide used, the cadmium salt forming the largest and potassium the smallest of the three salts most commonly in use. This order would seem to bear a direct relation to the solubility of the respective salts in the volatile constituents of the film. The form of the spots before exposure is a clearly-marked circle, which after development becomes extended over a much larger space, the edges losing distinctness and gradually merging into the other parts of the film; the general effect is a peculiar form of mottling arising from destruction of the sensitiveness, which renders it impossible to develope more than a glimpse of the image here and there. Hypo., too, forms markings visible before development, but owing to the difficulty of reducing that salt to a sufficiently fine powder we have not been able to examine it satisfactorily.

The only substance with which we have successfully reproduced the typical emulsion spot with very minute nucleus is dust, properly so called; it appears to be immaterial whether it be scraped from the chemically-impregnated bench, or carefully gathered from some out-of-the-way corner beyond the access of chemicals. The result may differ by the presence of other forms of spot, but the real "Simon Pure" is also there. We therefore attributed that description of spot to *organic matter* in some shape, and not to any chemical influence.

In conclusion: in order to examine these various effects to the greatest advantage, it is necessary to protract the drying of the film as far as possible. Immediately after coating and "dusting" the plate it should be laid aside in a confined space closed from the atmosphere, such as a plate box or, better still, the dark slide. Under the latter conditions we have found a film containing only ether and alcohol imperfectly dried fourteen hours after coating—a period which is, we apprehend, fully sufficient to produce a distinctly noticeable action in any case under examination.

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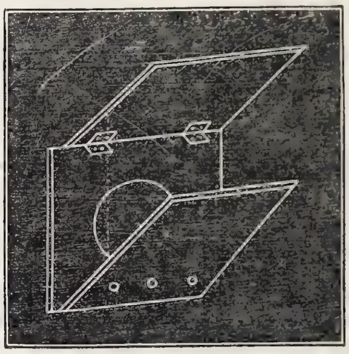
INSTANTANEOUS SHUTTERS.

Instantaneous shutters and dry-plate photography have hitherto had nothing in common. But in proportion as the long exposures peculiar to rarely-worked processes are giving way to those of a quicker character—seconds being now substituted for minutes—so does the aspiration of the dry-plate photographer increase for securing in their entirety those instantaneous effects so long associated with the practice of the wet collodion process. Now that dry plates may be made or procured possessing a degree of sensitiveness equal to that of wet collodion plates, the time has arrived when an instantaneous exposing shutter, or cap, should form part of the outfit of a dry-plate photographer.

Our readers will remember that both in the Journal and in our Almanacs we have at frequent intervals described appliances by which exceedingly brief exposures may be given, and in many of these are contained features of great utility. We now add to the number of instantaneous shutters already published by describing one recently devised by Lieut. Fairtlough, R.A., and which he has had manufactured for his own use. He finds that it works well; and, from a single trial we have made of the specimen kindly sent by him for examination, we are quite in accord with Lieut. Fairtlough in this respect.



The shutter consists of a square piece of mahogany half-an-inch in thickness, and of sufficient dimensions to contain a circular aperture permitting it to fit tightly upon the hood of the lens. In the specimen in question the diameter of the hole is four and a-half inches, there being two adapters to it to suit lenses of smaller dimensions. The size of the wood is six inches square. At the top and bottom are hinged two flaps of equal dimensions made of thin mahogany, their size being such that either of them when closed down quite excludes the light from the lens. These are retained in a position parallel to each other by means of a strap of brass, represented in the diagram by the dotted line. This strap is attached to one side of each of the shutters or flaps by means of a screw through a hole in each end passing into the edge of the shutter. Although we have not shown them in the diagram, there are three india-rubber bands which are slipped over the heads of the screws shown in one of the shutters, and fastened in a similar manner upon screws in the other side of the main piece. These by their tension keep that particular flap always pulled open, by which means the other flap is kept close down upon the lens.

We will now explain the manner of using the shutter. When a picture is about to be taken, and, previous to the shutter of the dark slide being drawn, the flap which is acted on by the rubber springs is made to serve as the cover of the lens, the rubber bands now exerting their full tensile force. It is retained *in situ* by a button or trigger; and when in this position the shutter of the dark slide is drawn, and the plate is ready for exposure. This is effected by releasing the button. The elastic force of the india-rubber bands now causes the shutter to be pulled away from the lens with great rapidity, its motion causing a corresponding one in the second flap which closes the lens. The capping of the objective is attended with a slight jarring or shock; but this is obviously of no consequence, inasmuch as it only occurs after the exposure has terminated by the lens being closely capped.

The rapidity of exposure is varied by increasing or diminishing the number or strength of the india-rubber bands; it is also varied by working with or against gravity—indeed it is amenable to much control. We find that, when it is worked against gravity, the elastic bands being upon the upper of the two shutters, the rate of travelling is such as to give much less exposure to the sky than to the foreground.

The ingenious shutter of Lieut. Fairtlough will, we believe, find an honourable position among the existing shutters devised for a similar purpose. It may be easily and cheaply made, and its construction should not tax the abilities of even the least pretentious artisan in wood.

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"PATENT" HYPOSULPHITE OF SODA.

At the present time there exists a loud outcry against foreign competition, which, it is alleged, is proving seriously detrimental to our industries. It were needless for us to utter much lamentation over such competition, for the question is one which can be viewed from two entirely different points—that of the aggrieved manufacturer, who not unnaturally prefers to see foreign competition restricted by import duties of such amount as would secure for the article of home produce a primary advantage; and that of the consumer, whose chief aim is to purchase at the lowest possible prices.

It is for the home manufacturer to make inquiry into those causes by which his rival competitor abroad can undersell him, even in our own country, and, having discovered these, to obviate them as far as possible. No motives of patriotism will induce a man to pay a high price for an article he can purchase at a lower one; for, as a purchaser, he eschews nationalities and patriotism and buys in the cheapest markets.

There are a few departments in the manufacturing industries connected with photography in which, possibly from the adoption of better methods, or possibly from labour being secured at a lower rate of remuneration, the English manufacturer does not appear to have been able to "hold his own" against foreign competitors, and among these is the manufacture of hyposulphite of soda. For a considerable period it found a place only on the shelves in the laboratory of the experimental chemist, whose supply of this chemical was limited to a few drachms. When through the discovery of photography an important use for it was found, and when, further, it was discovered to form the best "antichlor" that could be employed in the manufacture of paper, such an impetus was given to its preparation that, from being the rare chemical it was, manufacturers now speak of it by the ton weight. For a considerable period South Lancashire was recognised as one of the chief seats of its manufacture; but for several years past the major portion of the hyposulphite of soda made use of in this country has been supplied from Germany.

We hail with much pleasure an endeavour on the part of some of our own countrymen to enter into honourable competition with foreign manufacturers, and to supply a quality of hyposulphite of soda which is practically pure. A sample we have received of the work of the new manufactory is not only of a high quality but is also one of the most beautiful we have yet seen, the crystals being very perfect and transparent.

The generic methods by which hyposulphite of soda can be produced are few in number, and hence perfection in the manufacture of this salt must be looked for in the discovery of improved appliances for carrying into practical working the methods already known, and which do not seem capable of receiving further additions. These methods may be summarised as follows:—

Walchner's Process.—A pound of dried carbonate of soda is mixed with ten ounces of powdered sulphur, the mixture being exposed in a porcelain dish to such a degree of heat as to fuse the sulphur, after which it is well stirred, so as to allow the air to come freely in contact with it. The sulphide of sodium thus formed passes, with slight incandescence, into sulphite of soda, which is dissolved in water and boiled with powdered sulphur. It is next evaporated to the crystallising point, when the concentrated solution will be found to yield crystals of hyposulphite of soda.

Capaun's Process.—A dilute solution of caustic soda is boiled with sulphur to saturation; sulphurous acid gas is then passed into the solution until a small portion, when filtered, is found to have a very pale yellow colour, at which stage it is filtered and evaporated. A modification of this method, described by Gmelin, consists in adding the boiling solution of soda and sulphur to a neutral solution of sulphite of soda till the mixture acquires a decidedly yellow colour, after which it is filtered, evaporated, and crystallised as before.

Another method consists in passing a stream of sulphurous acid gas into a strong solution of carbonate of soda, which is then digested with sulphur at a gentle heat for several days. By evaporation at a moderate temperature the salt is obtained in large crystals. Brande says that it may be formed by exposing a solution of sulphide of sodium to the atmosphere until it becomes colourless, or by adding a solution of carbonate of soda to hyposulphite of lime, with subsequent filtering and evaporation.

In his *Inorganic Chemistry*, Miller gives as a good method of manufacturing this salt the transmission through a solution of impure sulphide of sodium a stream of sulphurous acid gas until it ceases to be absorbed; although he thinks that a better method consists in digesting a solution of sulphite of soda on powdered sulphur, when the latter is gradually dissolved, forming a colourless solution, which, upon evaporation, yields crystals of hyposulphite of soda.

It is the former of the methods described by Miller to which the patentees (Messrs. Powell and Atkins, of the Mersey Chemical Company, Liverpool) of the process now to be described give the preference, and they are very explicit in the statement that their special claim as patentees does not lie in the making use of the chemicals employed by them, but in the general arrangement of the plant employed in giving practical effect, on a large or manufacturing scale, to the process they employ in the preparation of the hyposulphite of soda.

From the following description the method of procedure adopted by the patentees will be readily understood, and we preface that description by giving the brief provisional specification:—

> "We take a solution of sulphide of sodium and expose an extended surface of it to the fumes of sulphurous acid gas. Our plan of doing this is by letting it trickle down through a chamber or tower packed with coke or other suitable material, through which a current of sulphurous acid is made to pass. The resulting solution on being evaporated leaves hyposulphite of soda."

In carrying out the details of the invention so very briefly foreshadowed in the above, the patentees first prepare the sulphide of sodium by heating the calcined sulphate of soda (the salt cake of commerce) in an ordinary reverberatory furnace with an admixture of small coal or other carbonaceous matter, by which means the sulphate is deoxidised and converted into sulphide of sodium. The sulphide of sodium is then lixiviated with hot water, and the solution exposed to the action of sulphurous acid by running it down a tower packed with coke or some other sufficiently porous material calculated to resist the action of acids and alkalies.

The tower is recommended to be circular in form, from three to seven feet in diameter, and from fifteen to thirty feet high, according to convenience and the amount of work to be done, made as far as possible air- and water-tight, and constructed of some material capable of resisting to a sufficient extent the action of sodium sulphide, caustic alkali, sulphurous acid, hyposulphite of soda, and other sulphur and soda salts incidental to the process. A tower made of separate pieces or staves firmly hooped together in the manner of a cask, and lined with india-rubber, is what is recommended. Up this tower a current of sulphurous acid is conveyed by draught, such acid being generated or prepared in the usual way, viz., by the combustion of sulphur or pyrites in sulphur burners or pyrites furnaces of the usual construction.

The resulting liquor is run from the bottom of the tower into vessels made of wood, india-rubber, or other suitable material; and then, the impurities being first allowed to settle out in suitable vessels, the clear liquor is run out into india-rubber trays, glass dishes, or other vessels constructed of material practically unaffected by the action of hyposulphite of soda (or of any unconverted sulphide of sodium or sulphurous acid), and there allowed to cool, when hyposulphite of soda is deposited in the form of crystals.

In the manner described was produced the fine sample of hyposulphite of soda already referred to as being in our possession. We may add that the specification enters very minutely into many working details, which, however, would prove of more interest to the manufacturer than to the general reader; but sufficient has been said to afford an excellent idea of the newest and most improved method of preparing this important salt.

On the advantage of using a thoroughly good quality of hyposulphite of soda it is needless to enlarge. By the method just described the quality obtained is stated to range from ninety-six to ninety-eight per cent. of pure hyposulphite. We are glad to be apprised of this; for it is the opinion of numerous eminent photographers that to the impure samples of this salt which are occasionally (happily only *occasionally*) to be met with is due to no small extent much of that fading of silver prints which now and then appears to set in like an epidemic. It is obvious that a photographer who works his fixing bath at a given strength—a strength determined possibly from trials with a strong sample, and with which good results are obtained—will, when an impure or weak sample is supplied to him, find things go wrong and his prints fade from imperfect fixing.

NEW METHOD OF MAKING MIRRORS.

Most of our readers will be familiar enough with the process of silvering glass for the production of mirrors by means of the action of ammonia and essential oils or of certain salts; but we have now to inform them of a method as unique in principle as it would appear to be beautiful in application.

There are so many uses to which mirrors can be applied in photography that it is not a little remarkable there are not more to be seen in studios generally. Now that carbon processes are becoming so much more known, and are adopted in so many establishments, we think the time cannot be far distant when it will be the exception rather than the rule for the operator to be unprovided with a mirror so adapted to his lens as to enable him to take negatives for the single transfer process involving no more trouble or further disarrangement of his working apparatus than would the mere capping of a lens.

The commonly-known methods of covering a surface of glass with silver requires no apparatus and scarcely any chemicals not usually to be found among a photographer's store; but the new method we write about cannot be so readily performed. It possesses, however, so many points of advantage that if it can be made available on a large scale mirrors could be produced very cheaply. It consists in an application of electricity entirely different in character from the well-known electroplating, seeing that no liquid is employed.

The first indications of the new process were published some little time ago in America by Professor Wright, of Yale College, who showed how the inside of glass tubes which had been exhausted entirely of air could be coated with a film of metal by means of a continuous series of electrical discharges. This discovery has led to results that enable a triumphant answer being given to the parrot cry *cui bono?* that so often follows the result of patient scientific investigation generally. Professor Wright continued his experiments in the direction indicated, and already his conclusions theoretical and results practical have considerable value.

We may here explain that the passage of the electric spark from point to point is followed by the production in a limited area of a most intense heat—a heat which instantly suffices to melt the most refractory substances, and not only to melt but to volatilise everything subjected to it; thus, in the electric light between carbon points the current passing from the positive pole literally carries with it portions of the carbon, and deposits it upon the negative. It is not, however, supposed to convert the carbon into actual vapour, but rather to carry it forward in minute particles, the vivid incandescence of which are the cause of the light. Presuming that the actual action of the electric discharge, in the case of the deposition just described, was of an analogous nature, it was supposed that a surface of any considerable body would, being composed of a number of excessively minute particles lying upon one another, be dull or rough; but upon making examination of the films it was found that, so far from this being the case, they presented a surface of dazzling brightness which could be likened only to the peculiar lucid brilliancy which pure mercury possesses, to which the ordinary mirror of commerce, although it is produced by its aid, is far inferior.

Professor Wright hereupon instituted a further series of experiments, mainly with the purpose of ascertaining if it would not be possible to apply the process practically to the production of mirrors and specula, and he has met with complete success. Already he has made and coated a speculum four centimetres (a little more than an inch and a-half) in diameter with platinum which answered admirably. He employed a battery power about equal to four or five Grove's cells, the time it required being about three hours. He has found that platinum, gold, and silver can be equally well employed—the latter, however, being the least satisfactory from the ease with which it can be volatilised; it can, indeed, be distilled by the aid of ordinary furnace. But the palm must be given to platinum (which cannot be volatilised by a heat below that of the oxyhydrogen blowpipe), the film being of a very white colour. The surface of pure platinum, as is well known, is ordinarily capable of receiving a high lustre by polishing, and is very little below silver in whiteness.

By the new method a film with a perfect and brilliant surface is at once produced with great ease, while the well-known unalterability of platinum to atmospheric influences makes it very valuable, and the more so as the film adheres well to the glass. Professor Wright, acting upon the theoretical results of his investigations in the direction of colours transmitted by various thicknesses of the films, made a mirror by first producing a very thin surface of silver, and then one of platinum upon it, and the result he obtained was a mirror of peculiar and brilliant whiteness.

Pending further particulars of this important discovery, it has occurred to us that an improvement in the ordinary method of producing silvered mirrors might be obtained by first making a very fine silver film and then depositing platinum upon it by Böttger's method, which is as follows:—A liquid for this purpose is prepared by adding sodium carbonate to a solution of platinic chloride as long as carbon dioxide is thereby evolved, then a small quantity of starch, sugar, and, finally, common salt, till the precipitated metal exhibits a pure white platinum colour. Small objects may be platinised by mere contact action.

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GELATINE *versus* PYROXYLINE.

It will be evident to every student of photographic literature that the days of the bath and all the annoyance it entailed are rapidly passing away, and that emulsions, after struggling for years for an existence, are at the present time enjoying a monopoly of the attention of our most careful experimentalists, and have been brought to almost a state of perfection. There is no doubt that one drawback to the success of emulsions as first introduced was the presence of the soluble nitrates formed by the double decomposition of the silver and bromine salts, and that their removal, by washing or otherwise, gave an impetus to the process which has carried it on to its present degree of popularity. The system of washing, however, was attended by many difficulties, and no little uncertainty, all, or nearly all, of which have been removed by the methods of precipitation—the last and, perhaps, greatest improvement that has yet been suggested, and one which, when it becomes better understood, will, I think, be the cause of the abolition of the much-abused and often bothering bath.

In common with thousands of others in this and other lands who have made the practice of photography a hobby—not for any gain it might bring, but as a change of occupation or recreation—I have experimented not a little with almost every process and modification of process that has been suggested, and also, in common with those experimentalists, like occasionally to jot down such thoughts as may arise from such experimental work.

Taking it, then, for granted that, according to our present light, the most sensitive and suitable body for photographic work is bromide of silver produced in, and held in suspension by, a medium thoroughly adapted to the purpose, the question comes to be—What is the most suitable medium? or, rather, as gelatine and pyroxyline are the only substances experience has shown to answer well, which of the two offer the greater advantages? In any attempt to answer this question three factors must be taken into account—quality of result, which includes rapidity; facility of preparation; and economy—the first being, of course, the most essential, and the second and third depending to a certain extent on each other.

Looking at gelatine and pyroxyline as the raw material, there is at the outset a strong claim to be made in favour of the former; as although, chemically speaking, it is a complex body, the results of any special method of manufacture from any particular and suitable animal matter are tolerably uniform, and there is no difficulty in finding in ordinary commerce an unlimited supply of the desired quality. But with pyroxyline the case is very different. Being a substitution compound, in which the various molecules may exist in several proportions, the distribution of which depend on temperature, strength of acids, quality of cotton or other material employed, and other causes of which little is known, the manufacturer would be more bold than prudent who would undertake to produce a really uniform article. Such, at least, is the result of my experience, and it has extended over a period of a quarter of a century, and that not merely as an experimentalist but a pretty extensive manufacturer. I think, also, that this idea is supported by the fact that so much continues to be said of the necessity of getting a suitable sample of pyroxyline. It is admitted that both the sensitiveness of the silver bromide and the facility with which a dense image is obtained depend much on the nature of the organic matter in the presence of which it is formed, and I consider, also, that on the whole the balance of evidence is in favour of gelatine. At all events I know, and had practical proof that others are aware also, that a dry gelatine plate may be made which will be more rapid than ordinary wet collodion, and which will give, by what a surgeon would call "the first intention," an image of sufficient density for all ordinary purposes.

I had called on a professional friend pretty late in the afternoon, and, as usual, found my way into his dark room. He was engaged with a lady, and on developing the plate—a wet collodion one—it showed a considerable want of exposure, in connection with which he said—"Well! the light must be worse than it looks, as I gave it fifteen seconds, and that ought to have been enough; but I have got some gelatine plates that will enable me to secure her." A dry plate was taken from a box and exposed for the same time, and with a three-grain solution of pyrogallic acid to which a few drops of solution of ammonia had been added, when a rich, fully-exposed negative was produced. I may add that on looking over the negatives taken during the three or four previous days—some of which were by wet collodion and some on dry gelatine plates—the latter showed a soft yet brilliant beauty and a delicacy in the shadows and middle tints much superior to those by the former method.

With reference to the facility of preparation, the gelatine emulsion is vastly superior to the pyroxyline. The most soluble cotton contains some insoluble matter which should be allowed to subside, and in many cases several days must elapse before a workable emulsion can be made; while with gelatine the whole operation, including the coating of the plates, may be finished within an hour.

The method of precipitation introduced by Mr. Wratten is an immense step in advance, and will do more for gelatine than all that had hitherto been done, although his recommendation to use methylated spirit at 2s. 6d. per pint is calculated to raise a smile on the faces of those who know more about that article than he seems to do. I was glad to see that Mr. P. Le Neve Foster had taken him to task in connection with this matter; but from his reply I think a word or two more would not be out of place. The fact is that there is no such article in existence as methylated spirit at 2s. 6d. per pint, and if there were I should not know which to blame most—the person whose greed would allow him to charge such an exorbitant price, or the simplicity and ignorance of the person who paid it. At 2s. 6d. per pint it would amount to 20s. per gallon, and I suppose the present price of pure spirit is not more than 22s.—a saving far too insignificant to induce any one to use the impure article in preference to the pure. The explanation, however, is not difficult to find. Mr. Wratten "confounds two things that differ"—spirits of wine, having a s. g. of 0·838, and so-called absolute alcohol of 0·796. The former is worth 22s. per gallon; the latter 5s. per pound, or about double the price of the former. Methylated spirit—frequently called "methylated alcohol"—is, as everybody knows, only spirit of wine to which has been added a proportion of wood naphtha of a suitably-impure character; and, as the duty of ten shillings per proof gallon is thereby saved, it should not, under any circumstances, cost more than six shillings per gallon. I am aware, however, that there is, by those who know where to go, to be found in commerce an absolute alcohol made from methylated spirit having a s. g. of 0·796, and no doubt it is to that Mr. Wratten refers; but he had better not say where he gets it, as I have a notion that the Excise would have something to say on the subject, Government being very jealous of any interference with methylated spirit. But it is a matter of little importance to gelatine workers, as the ordinary article is quite strong enough for the purpose.

Lastly: as regards the question of economy, gelatine is much superior to pyroxyline. Four times as much of the former as of the latter is required per ounce of solvent; but it only costs about one-fourth of the price, and so far they start on equal terms. The saving, however, of ether and alcohol—by far the most expensive constituents of collodion—will enable the gelatine process, especially when carried out on a large scale, to be worked at little more than half the cost of the pyroxyline emulsion. Looking at the question from all the various points of view, then, I have little hesitation in saying that the future of photography will be closely connected with gelatine, and that in the production of negatives, as well as in the prints from them, it will yet prove to be the "happy medium."

John Nicol, Ph.D.

THE ART OF PAINTING UPON THE PHOTOGRAPHIC IMAGE.

No. IV.

When the general wash on the face is quite dry take a little rose madder and stipple up the carnation on the cheek, softening it off towards the ear and temple, taking care not to carry it too far towards the eyes, or a blushing effect will be the result. If now a wash of colour with gum of a suitable tint to represent the general effect be washed over the hair, and a little blue or brown, as the case may be, stippled into the iris of the eye, the picture will have arrived at that stage of finish known as "tinting;" that is, supposing the wash to be tolerably even, which after a little practice will be found easy to do.

But if it be required to produce a finished work, some such method as the following must be pursued:—Having got your appropriate general wash on, and the carnation flooded in, take some warm colour and wash over the *darkest* shadows; if the print be a delicate one and the deep shadows are not very black a little dragon's blood or Rubens' madder will produce a nice, transparent effect. But if the shadows be very black a strong wash of orange chrome may be put on fearlessly, or, if the print be one of medium intensity, a little orange chrome, glazed afterwards with Rubens' madder—anything, in short, to get rid of the photographic look. It will then be found that between these blackest shadows and the very faint ones, or pearly tints, that should be in a really good photograph there are some shadows of medium depth; these should be treated with raw umber—a most beautiful colour, and the precise thing for the purpose. If the photograph stop here—that is to say, if it be a very harsh black and white photograph and have no delicate pearly tints—the latter must be supplied by using the shadow tints—the most purple one for fair complexions, and the other two for darker and more sallow complexions. By consulting good photographs it will be seen where these ought to come. Much information may also be obtained by consulting the dark side of the face for suggestions for making up the deficiencies of the light side. It will, for instance, be often found that a part of the eyebrow on the light side has quite disappeared; what it was like will easily be judged of by looking at the perfect one at the other side.

There are two kinds of shadow in a face as in all things, viz., cast shadows; that is to say, shadows thrown by one thing on to another—the shadow cast by the nose, for instance, and those shadows which are caused by the rounding or retreating of the surfaces from the light. The former are, as a rule, sharper than the latter, which are soft and gradual. Cast shadows, too, in a face are usually "warm," that is, approaching to red or orange; but all round the edges of them run delicate shades of a cold or bluish cast. Avoid hardness in a face; remember that flesh is a soft, palpitating thing, and covered all over with a delicate down that prevents anything like hardness in nature.

If a hole be cut in a piece of white card and held between yourself and your image in a looking-glass, you will see, if you move it about, how very little pure "flesh" colour, so called, there really is in a face; it is nearly all grey, or, rather, greys of different depths and tints—greenish in some parts and purplish in others. To further satisfy yourself of this it is an excellent plan to take a mirror, get a canvas or paper of the same size, put them side by side, and then, sitting at arm's length, make a careful study in either oil or water. Much that is simply invaluable should thus be learnt by the student.

Having got the face as far advanced as possible with washes of the colours recommended, you may begin to stipple, mending up all the shadows; and if by any mischance you have got the colour wrong it may now be remedied by stippling some colour in to counteract that. For instance: if a shadow be too warm stipple in a cool green, or a purplish tone if too orange. It will generally be found that the raw umber passages are best stippled up with sepia.

The eye requires great attention; if it be a brown eye it will most probably have come out an opaque black spot. If so, take some thick orange chrome and boldly cover it all over, and when dry treat it with sepia and gum. Put in the pupil, in the right place and of the right shape, but a trifle larger than in the guide print; next put in the spark of light, if the eye be in such a position as to receive any, and then with Vandyke brown and gum carefully stipple in the deep brown part, leaving the liquid-looking light that creeps into the side of the eye all round the pupil at that side farthest from the light. The outside line of the iris may generally be made rather larger than in the photograph, large eyes being handsomer than small ones, and the white of the eye generally encroaches a little on the iris in a photograph.

Joseph Wake.

PRECAUTIONS IN COLLECTING RESIDUES.

Some years ago I published in the pages of The British Journal of Photography details of my method of precipitating and collecting residues, and it has so far answered all requirements as to be still carried out in its integrity, as then described, in my studio.

I remember, a year or two after the article was written, while on a pedestrian tour in the lake district, striking up an acquaintance with a photographer, whose *impedimenta* had proclaimed his errand. He told me he had stuck my instructions up behind his dark room door, as he had found they just suited him. Many times since I have met with photographers who have expressed their indebtedness to me for so strongly recommending the extraction of silver from hypo. residues.

The value of this item depends to a considerable degree upon the paper used, a weakly-salted one producing far less silver in the same amount of hypo. than a more highly-salted paper. Of course the hypo. used for fixing negatives is not governed by any such rule, as it is customary to use it till it is saturated with silver and then to replace it with a new one, while for paper it is, or ought to be, the custom to prepare it fresh each day, using only a certain quantity of hypo. for each quire of paper. The former solution will naturally be much richer in silver; so that, though its quantity is so small, it will be a great mistake to reject it, a quart of it containing perhaps as much silver as a couple of gallons of the paper fixing bath. I do not in my practice collect the first washing water from fixed negatives, yet I am sure that if proper storage conveniences were at hand that enabled one to disregard its bulkiness it would be well worth while to do so. I should not, however, consider it worth while to preserve the washings from the paper, more especially as it is so important at first to free the prints as rapidly as possible from the adherent hypo. with a copious supply.

The method I recommended, as in use in my studio, was to have two wooden receptacles—one to deposit the precipitate while the other was being filled. The silver was thrown down as sulphide by means of the sulphide of potassium, commonly known as "liver of sulphur." It is essential that this chemical should be examined as to its freshness; for, if not properly kept, it becomes in time absolutely useless, and, more than that, it is misleading. When quite fresh its fracture shows a rich liver brown colour (whence we have the name "liver" of sulphur) and the outside is covered with a light greenish-yellow film, caused by the decomposition of the sulphide under the influence of moisture and air. This change takes place very rapidly unless the chemical is kept in a tightly-stoppered or corked bottle; but there need not be any danger of being ignorant of its extent if the precaution be taken to break a piece in two. As the decomposition takes place the liver colour gives way to the light yellow, and the two layers will be seen at a glance, if, indeed, the whole mass have not become altered, in which case it may as well be thrown away. The freshly-prepared sulphide is also very hard and difficult to break. I am thus particular in giving these instructions for the reason that, as the material is one not at all commonly met with in the shops, the photographer who sees it for the first time would not know whether he had purchased a useless lump of dirt or a useful and economic aid to his printing department.

The sulphide will be less liable to decompose if kept in solution, and this is what I should recommend, as its deep orange colour will always give a good idea of its strength.

I have laid stress upon the necessity for the precipitating agent to be in proper condition, owing to the experience of a photographer who had adopted the plan through my advice, but had contemplated giving it up, as he got nothing to speak of for his trouble, and what he did was almost worthless. Upon examining into the matter I found his printer had a stock of sulphide two or three years' old, a few lumps of which he put into the hypo. water, gave a stir, and in a day or two run the top liquid off. I need scarcely say he obtained nothing but a deposit of sulphur—the insoluble residue of the decomposed sulphide—as the fresh salt dissolves almost entirely, while the old is, to a great extent, insoluble. As it is very probable that this may have been a common experience with others who have tried to save hypo. waste, I would suggest to any who have not adopted the process, or have given it up, to try again with these hints in view; for the money value of the silver obtained from this source ought to average that obtained from chloride—the sulphide of silver, weight for weight, being more valuable than the chloride.

My next advice is on no account to use the liver of sulphur by merely throwing pieces in, but always to dissolve it beforehand and use only the clear fluid; for the lumps take such a time to dissolve that it is very unlikely the precipitation would be completed in time, and the bulk of the solution would be drawn off without having been exposed to the action of the precipitating agent. Of course, in small establishments, where the principal looks after such things personally whenever they are done, there may not be much danger of any such *contretemps;* but, as a rule, those to whom these things have to be delegated cannot always be trusted to have the necessary amount of knowledge and, indeed, intelligence to carry them out properly.

I may relate a recent experience of my own, bearing upon this very point, which, indeed, was what first gave me an idea that my own was by no means likely to be an isolated case, and that a few words of advice suggesting the precautions which had occurred to me as being necessary might be useful and acceptable. On the occasion I refer to I went to my printing rooms, and found the head printer just about to run off the hypo. from two of the vats after they had stood to clear. He took up in a measure a small quantity of the supernatant solution, and, dropping a few drops of the sulphide solution into it, found no precipitate, whence he concluded that the silver was all thrown down. The whole liquid, however, looked so unlike what it should do that I ran some of it off myself through the *tap,* and found there was a large quantity of silver still in solution. Now I consider my printer to be a very intelligent man, and yet he had made a grave mistake in the way he went about the work. He had, I could then see in a moment, added a quantity of precipitating solution, but only superficially stirred it in. The solution being of such a strength that its specific gravity was less than that of the hypo. it had not mixed to any depth, and the bulk of the hypo. remained without any admixture. The remedy is obvious: let the precipitating vessels never be filled to the brim, but enough space left to permit of violent agitation with an oar-shaped stirrer. And, finally, test, for the presence of silver, both the upper layer of liquid and the lower obtained through the tap.

If there are any photographers who do not save their hypo. residues, I again take this opportunity of strongly urging them to do so, as the gain is so great. G. Watmough Webster, F.C.S.

NOTES FROM AMERICA.

Writing for the Journals.—Solar Spectrum Analysis.—Showing Proofs.—Photographing Children.—Carbon Printing in Hot Countries.

We not unfrequently come into friendly contact with photographers acquainted with numerous "dodges and wrinkles" who, upon being asked to communicate them for the benefit of their fellow-workers, express their diffidence in doing so because, as they intimate, it is not improbable that they are already known to and practised by others. While this may be quite possible, the journalist has to look to the requirements of the many rather than of the few who, from their experience and ability, appear to know everything, and in the interests of the many has frequently to solicit practical information on topics familiar to some readers. This has been discovered by the editor of the *Practical Photographer*, who makes a common-sense appeal to the more experienced of his readers to come forward and aid those who do not know so much. He says, addressing a landscape artist:—

> You are thoroughly posted in landscape work; now, give us an article for the same. "Me! what could I write about? I don't know a thing that is not perfectly common." Now, don't talk that way. We are growing grey under the focussing cloth, yet we learned a new wrinkle in your gallery the last time we were there. "Well, yes, you said you did, and paid for it on the spot by giving me another." Now, you have admitted two facts; just clothe these in words and send them to the journal, with any other little thing you happen to think of, and you will confer a favour on some other brother, as you did on me. "Oh, I can't! Why, man, I would be ashamed to see my name at the end of such an article." *Don't give your name.* Do as others do, sign yourself "Jack the Giant Killer," if you like. It is not your *name* the brotherhood want; it is your *knowledge*, your *experience.* You made us laugh once by telling how you got into a scrape by leaving something behind when you went viewing, and how you got out of it. Now, just put that story on paper, and no doubt some fellow craftsman will remember it when he gets into the same or a similar fix. "Oh, nobody but a fool would do such a silly thing, and a fool is not the man to write for a journal." Now, my friend, just look over the *Mosaics* for any year, or the *Photographic Year-Book*, or *Photo-Almanac*, and see how many things are communicated to them that are old to you; yet not an item in these works was worthless—it was new to some one. * * * Come over and help us. Don't be backward in coming forward. If we happen to know all about it it won't hurt us to have our memory refreshed; if we don't know it then we have a chance of getting an idea, which in all probability we have been hunting for—like Solomon, when looking for a wise woman in the wrong place.

To the results of the investigations into solar physics we have so recently published we are enabled to add Professor S. P. Langley's *New Method in Solar Spectrum Analysis,* just published in the *American Journal of Science and Arts:*—

> No observation of modern physical astronomy is more striking in its conception than that which attempts to determine the motion of a celestial body by the altered wave-length of its light, and none has attracted more general attention. It is popularly understood that the proper motion of certain stars in the line of sight has been thus completely demonstrated, but those particularly engaged in such studies know how far astronomers have till very lately been from the certainty

attributed to them. It can hardly, however, be deemed superfluous to still offer, upon so important a question, the results of an independent method of measurement, and one which renders errors from instrumental displacement—on the danger of which so much stress has been deservedly laid, in the sense in which the word is here used—not only unlikely but impossible. The theory of the proposed method is very simple. Let two spectra be formed side by side, the one of light from one edge to the sun, the other of light from a point 180° distant. The instrument being in adjustment, if these points be in the neighbourhood of the solar poles which are relatively at rest all the lines will be continuous in both spectra. But if the instrument is rotated till the light comes from points on the eastern and western sides of the sun, which are in relative motion, not only will the solar lines be discontinuous in the two spectra, as though the one receiving light from the advancing or eastern side had been slid past its neighbour towards the violet, but any mal-adjustments of the instrument which simulate this effect can with certainty be detected by a means to be shortly described. The solar spectrum consists of two distinct kinds of lines—one caused by absorption in the solar, the other by absorption in the terrestrial, atmosphere. These latter, being formed by light from all parts of the sun, are independent of its rotation. The prisms are adjusted till, on looking on the sun directly, the lines are all continuous in both spectra, then the instrument is put in the telescope and the slit placed at such a position-angle that the light in spectrum A comes from the vicinity of the north solar pole, that in spectrum B from the south. On looking in we see a very long and narrow spectrum, filled with dark lines and exhibiting the chromospheric lines on both sides. It is divided by what appears to be a very fine dust line in two exactly corresponding parts, and is in reality two distinct spectra, as we see by the opposed chromosphere lines; but as the sources of light for both spectra are relatively at rest, all the dark lines are still continuous. But now (without disturbing any adjustment), revolve the whole 90° about the optical axis passing through the centre of the solar image, so that spectrum A is formed by light from the eastern or advancing edge of the sun, and spectrum B by light from the western or retreating one. A curious change has taken place. By a very minute but perceptible quantity, spectrum A appears to have been slid past his neighbour toward the violet end, so that every solar line in the first is "notched" at is junction with the second; while, at the same time, the telluric lines are as unaltered as the fixed lines of a micrometer web would be, by moving a scale about in the field. The effect is the same as though the spectra were tangible things, like two engine-divided scales, whose numerous delicate divisions (represented by the solar lines) were all in exact juxtaposition a moment before, and are all now just perceptibly displaced, as when a vernier plate is moved till a coincidence is made at a new stroke on the limb. Moving the instrument 90° more, we come again into the axial line of the sun, and the coincidence should return. With still 90° more we are again in the equator, but now spectrum A is formed by light from the western edge, and this time it is moved the other way, as if it were a scale which had been slid by a very slight but distinctly-perceptible amount toward the *red* end; while still the telluric lines retain their continuity, assuring us that no mal-adjustment has occurred. It will be admitted that this change is, if real, excellent experimental evidence that the wave length is virtually different in light from the eastern and western limbs, as theory predicts; for, granting that the instrument is mal-adjusted in any unknown way or degree, any *instrumental* cause will affect solar and telluric lines alike, and we may, in fact, defy ingenuity to suggest an error of adjustment which will modify one and not the other. It will be remembered that many lines in the spectrum are only seen when the sun is low. These are clearly due to the absorption in our atmosphere. Many thousands, as we know, are due to absorption in the sun's atmosphere. There remains a large number of lines not coincident with any we produce at the electrodes of our battery, and always present in the spectrum. Of these we do know that they are either caused by the sun's atmosphere or ours, without always knowing which, for these can only be inferred to be telluric from their growing stronger as the sun sets, and this, though easily determined in the case of a single line, becomes a task of great labour where we deal with thousands. It is evident, however, that after having used known telluric lines to determine the fact that the refrangibility of solar lines only is altered, we can reverse the process, and classify unhesitatingly hereafter all lines as telluric which are unaffected by the changes that compel others to betray their solar origin. To merely see these two spectra with clearness, then, is to be enabled to pick out the telluric lines from the others, as though they were mapped before us. They are mapped, in fact, and it becomes, under the proper conditions, a matter of simple inspection to determine them.

Referring to the subject of showing proofs and of photographing children, the *Practical Photographer* considers both to be unmitigated nuisances. Concerning the former it is observed:—

At first it was all very well to show proofs to see if the expression was satisfactory, but now the proof must be taken home to be criticised before the work is finished, and the dress, hair, ribbons, jewellery, and many other things of less note are criticised, and the poor photographer, in trying to please, in getting a good expression that he really has no control of has brought unto himself a world of miseries. Abolish the proof business, we say; it is a nuisance in the profession. If you will show a proof at all show it in the gallery; never let it go out to be criticised by uncles, aunts, cousins, friends, and all relations down to the fifth generation, if they should happen to be within hailing distance. Another source that tries the patience of the artist is taking of children. Most all mothers think their children the handsomest they ever saw, and, as a matter of course, they want it standing, the dear little thing (only ten months old). Nervous artist, with plate ready, says it cannot be done. This brings war into the camp. Mother feels that she would like to do or say something to Mr. Artist, who is supposed not to know anything about babies, because Mrs. So-and-So had her dear little baby taken standing (an accident), and it was only two years old, and it was not a bit larger than my baby. No use, the plate was spoiling, to take a baby. Other customers were waiting, and they both agree to disagree, and a compromise is made. The mother agrees to try it sitting, but knows in advance she will not like it. Here is encouragement for the operator. Now let this picture be ever so good fault will be found with it. Mothers are very unreasonable at times in asking impossibilities in having their small children taken, and I would recommend all artists to adopt the plan of a friend of mine, Carl Meinerth, of Newburyport, Mass., who has up a sign—"Children's pictures taken here any way; once for nothing, extra sittings fifty cents each time, good or bad, till somebody gets tired." Now, as we said in the beginning, "what we all need" is a good stock of a kind of sort of a mixture that you can either take or give, spiced with some independence, a good deal of humility, being a little deaf at times, and blind too, with self-admiration laid on one side in your gallery. Take advice from your patrons—that is, let them think they know it all more than you do, and you will be sure to succeed by a large majority.

In common with many others we have had an idea that carbon printing, when it broke down at all, did so in consequence of climatic influences. From experience acquired in our own practice we can imagine difficulties arising from the high temperature existing in countries situated nearer the equator than our own, and we can, and frequently have, suggested means by which the ill effects of high temperature upon the sensitising and development of carbon tissue might be obviated. We are pleased to find that, in a communication to the *Practical Photographer*, by Mr. Theodore Lilienthal, of New Orleans, written in the middle of last August—a month during which the weather is presumed to have attained the highest temperature — the difficulty experienced by him in working the carbon process, if any such ever existed, has been successfully overcome. In his experience—

The prediction made, that carbon cannot be worked successfully during hot summer months, is not correct. I (he says) work it every day with equally as good results as I did in the winter, and I am located in the worst climates of any city in the Union, surrounded by water and swamps, and warmer all the year round than any where; the climate very changeable and steady; evaporation from the earth, on account of the swamp land on which the city is built, besides numerous other disadvantages I could mention, which I have completly overcome, and with 95° of heat in the shade at present I work without any interruption. I should like nothing better than for any of the doubting Thomases to call on me and convince themselves of what I have stated, and they would soon come to the conclusion that the carbon process can be worked practically all the year round, and with no more failures than the silver process. I do not make this statement for the object of changing the various ideas of those who are opposed to the carbon process. Time will teach them how greatly they were mistaken. But I desire to say to those of Lambert's licensees who do not altogether succeed, not to charge it to the process but to themselves, to continue in their work and they will certainly overcome all their failures, which mostly are caused in not fully understanding the workings of the same and the drying of the tissue, which is one of the most important points. Should the tissue not be dried within the space of six or seven hours (in summer) and at a low temperature it will become insoluble and, in consequence, worthless. The failures caused by the above are more numerous than by anything else.

The demands on our space necessitate our leaving over the remainder of these interesting *Notes* for a week.

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LICHTDRUCK.

The plates used in lichtdruck may be bought perfectly level and matt, consequently the operator is spared the wearisome task of grinding two plates one above the other. Plates which have already been used for lichtdrucks I steep for a whole day in an alkaline lye made from either wood ashes or soda, remove the softened film with a knife as well as it will come, and then remove the last trace of the film from the pores of the plate by grinding the latter with pumice stone. Upon thinnish copper (not brass) plates, specially prepared for lichtdruck, this process is extremely easy and simple. Fasten the thin copper plate upon a level thick slab, and then place upon the former the sensitive film, consisting only of gelatine, water, and bichromated salts, without any other addition. Films adhere very well to matt ground copper and print easily. The exposure may be regulated by strips of chloride of silver or bichromated papers and *experience.* As a sensitive film I use a mixture of—

Bichromate of potash	1 part.
Gelatine	5 to 7 parts.
Water	50 to 70 ,,

Upon the drying of the film—which is an important process, since the result depends so much upon it—I shall speak later, and also of the influence of more or less of the chromate salt.

Printing films upon glass plates require a substratum in order to cause them to adhere. For this purpose I use a thin film of albumen, gelatine, and water, or of albumen and water alone, with just as much bichromate as shall not recrystallise when dried at 20° or 25° R. 480 parts of water, twenty-two of gelatine, 240 of albumen, and twelve of the bichromate is a mixture worthy of commendation. The advantage of this formula is that the product may be dried in a room at an ordinary temperature without the bichromic salt recrystallising. Plates thinly coated with this mixture, when dried and protected from the light, may either be used immediately, or from eight to fourteen days after. The film and matt side of the glass plate being laid upon a dark woollen cloth, weak diffused daylight is allowed to fall upon the transparent side. By practice one soon gets to know, by observing the colour of the film, when the proper degree of lighting has been reached.

The substratum must possess two properties—first, that of adhering fast to the glass; and, secondly, that of adhering to the second or printing film. It is faulty in the first particular if it be lighted too short a time, and in the second if too long.

Another formula for the substratum is water forty-five parts, albumen thirty-five parts, and fifteen parts of a saturated solution of the bichromic salt. This formula is excellent and highly to be commended. Films prepared according to this formula should not be dried under 20° to 25° R. I have also, with dilute water glass, without either albumen or chromium, produced a substratum to which the printing film adheres well, if the gelatine be suited for printing and the drying arrangements are suited to the purpose. In drying, damp air must be avoided as much as possible, and there should be no injurious external influences allowed to act upon the film. Upon the drying of the films there is much that is practical and worthy of attention to be said, but I shall reserve my remarks on that subject.

It is with lichtdruck as with all other branches of photography. One operator works by one formula, another works by another formula, and each finds the manner he is most accustomed to the best, and willingly confines himself to it. For instance: one believes this or that addition to the gelatine is either necessary or useful, which, by carefully-arranged comparisons, is recognised to be either totally worthless or at least without any good result. Now, there is no simpler compound than that given above as a printing film, and which I found for myself and verified. The most useful addition (though not required by all kinds of gelatine) is albumen, but only in the smallest quantities.

Supposing the mixture used for the printing film to be either my extremely simple one or another more complicated, the production and drying of the film demands practice and experience.

That gelatine, though always got from the same source, varies as much in quality as does butcher's meat I have learnt from nine years' experience with lichtdruck; and anyone who knows about the preparation of gelatine and the variety of raw material from which it is made will easily understand how this should be. Therefore, in the case of a photographic process where only gelatine, water, and a bichromate are used, an absolutely-determined formula applying to all cases without exception cannot be given; but according to the contents or the properties of the gelatine the composition of the mixture has to be modified. The following, which I have tested during a long series of years, will, therefore, give better starting points for superior lichtdruck methods than many so-called methods and formulæ, of which the greater part—especially those patented—seem only to be intended to lead away from the right road. Very concentrated gelatine solutions furnish a rough printing grain. For gelatine not stiffening easily at 15° R. a mixture of one part of gelatine to eight or ten parts of water is the correct proportion. Another gelatine gives a finely-grained film only with from twelve to sixteen parts of water.

The same result is got with many other sorts of gelatine, in spite of all care in the handling, merely through the addition of albumen. Then, if with a thin solution of gelatine a thick film be prepared, if it contain much bichromate, and if it be dried at a high temperature, the bichromate will be thrown down and the gelatine effected, so that the texture of the printing film will be as coarse as in a roughly-finished lithographic stone; it is evident that in such a case fine impressions are impossible. Then too-quickly-dried films show almost no relief when washed, whether they contain much or little of the sensitising salt. *These* films are also unsuited for printing purposes.

A high temperature, so thoroughly mistakenly recommended in many lichtdruck formulæ, is to be avoided. It certainly depends very much upon the gelatine and the salt it contains; and, further, whether the gelatine itself was prepared at a high or low temperature, and what it was prepared from. Also whether the salt of chromium is a bi- or a tri-chromate, whether it is a double salt of potassic and ammoniac oxides, &c., or whether it is only a salt of potassium, and whether it contains an oxide of iron, &c., have all, I find, an influence upon its power and fineness. In short, the more concentrated the chromate mixture the rougher the film.

Too much albumen in the gelatine has many drawbacks. I have had occasion to try some sorts of gelatine which, without the addition of another sort of gelatine, could not be used for lichtdruck at all, never giving clean prints. Again: certain kinds of gelatine recommended by the trade as especially suited for lichtdruck, and sold at a high price, often turn out much worse than the common sort, which may be bought of any druggist. When there are gelatines that only furnish good, fine impressions when the film is dried without any salt of chromium, and then when dry sensitised in a cold, saturated solution of the chromic salt with the addition of a little dissolved sugar (as recommended by me for the last nine years) then dried at a gentle heat, the mixture of the chromium salt and the sugar solution should only be allowed to act a very short time—say thirty seconds—upon the film. In a similar way I prepare my photolithographic paper, taking a fine thick paper, soaking it a short time after lighting, and laying it wet upon a glass plate, wrong side downwards, and then ink it with a fine roller. It is easy to see that the transfer is finer than that got by the old methods. This method may also be used for other purposes than that of producing transfers; but I cannot say more upon that point, not having had an opportunity of making exhaustive experiments. In many other places it would be easy for me to try further applications in this direction, but unfortunately all opportunities, assistance, and materials are wanting here.

With respect to the ink to be used either for lichtdruck or photolithography: it should be (1) not too crumbly (2), not too viscous (3), not too solid to spread out extremely fine, and (4) not too thin or greasy. Too viscous or too solid ink, rubbed down with weak linseed oil varnish or with linseed oil, gives a suitable ink. In choosing coloured inks for lichtdruck all those must be rejected that either corrode or tan the gelatine film; also, all colouring matter which is either bleached or darkened by light should be carefully avoided. Every professional man knows that there is a sufficient quantity of fugitive fading photographic work in the world already without misusing the lichtdruck process in order to produce more. JOSEPH LEMLING.

—*Photographische Correspondenz.*

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FOREIGN NOTES AND NEWS.

A DECORATION.—DECEASE OF A PHOTOGRAPHIC ORGAN.—A NEW PHOTOGRAPHIC ORGAN.—GLASS PREPARED FROM CALCIC PHOSPHATE.—A NEW PHOTO-ETCHING PROCESS.—OZONE THE CAUSE OF RETICULATION OF THE CARBON FILM.—BOILED WATER AS A REMEDY FOR AIR-BUBBLES.—AN *INFALLIBLE* SPECIFIC AGAINST BLISTERS IN ALBUMENISED PAPER.

IN recognition of the merits of Dr. Beck, the director of the State Printing Establishment, the Emperor of Austria has conferred on him the Knight's Cross of the Order of Leopold.

Owing to the retirement of Herr Schwier, of Weimar, from the editorship of the *Photographischen Wochenblattes*, the publication of that journal is for the present suspended, and the German Photographic Society, which has its head-quarters at Thüringen, is without an organ. The *Wochenblatt* had been in existence only about two years.

From another source we learn that the German Photographic Society will publish the first number of its new organ, to be called the *Deutsche Photographen Zeitung*, on the 1st of October. The new journal will appear fortnightly until the new year, after which it will be published weekly.

According to Sidot, in the *Comptes Rendus*, acid calcic phosphate is changed by heat into a crystalline mass. This mass, called by Sidot "pyrophosphate of calcium," is then heated again to a still greater temperature, when it assumes a glassy appearance, and by giving off part of its constituents it is converted into tribasic phosphate of lime ($3\,Ca\,O, PO_5$). Glass prepared in this way is perfectly transparent, and the index number of its breaking point is 1·523, while that of crown glass is 1·525; its density is 2·6. This glass is not affected when cold by acids, but when hot it is acted upon both by acids and by potassium. Fluoric acid does not act upon it.

In the Austrian *Printers' Journal* a new photo-etching process is thus described:—A polished silver surface is subjected to the action of iodine, and a thin film of iodide of silver is obtained. This prepared plate is exposed under a negative until a weak print is obtained. The plate is then placed in a galvanoplastic bath, where copper is deposited only on the parts affected by light, so that a distinct picture is produced in copper. When the plate has become dry it is treated with a mixture of sulphuric acid and nitre, or some other substances having a similar action; that is, which attack the uncovered parts of the silver plate, but leave the copper untouched. As soon as the etching has gone deep enough the copper may be removed with *aqua regia*, and a finely-etched picture remains on the silver plate. In order to etch upon steel or copper the surface must first be coated with silver and then the proceedings described are repeated, the etching medium chosen being suited to the metal employed.

In a late number of the *Photographische Correspondenz* Dr. Adolf Ott recommended an addition of seventy per cent. of spirit of wine as a preventive of reticulated surfaces on carbon tissue. This addition Herr Von Stefanowski, writing in the current number of the same journal, thinks not only extravagantly expensive but unnecessary, except in the case of too soluble tissues. Using tissue prepared from grenetine or German gelatine, he has never been troubled with reticulation of the film; but when winds charged with ozone prevailed he has been troubled by another effect, namely, great difficulty of dissolving the film. In July he remarked that freshly-sensitised tissue was often much more difficult to develope than that which had been prepared several days before. Having sought for the cause of this phenomenon in the tissue itself, in the bichromate bath, and in the developing water, and having found no trace of it in either, he was convinced that the presence of ozone must be the cause of insolubility, for the bichromate salts were present in large quantities in the gelatine film. When the bichromate contents of the sensitising bath were reduced by one per cent., or even by a half per cent., the tissue exhibited its ordinary properties, even in the presence of a storm-laden atmosphere, and there was scarcely any perceptible difference in the length of exposure required. The practical conclusion which Herr Von Stefanowski arrives at from these premises is that, when one has tissue suffering from reticulation, the alcohol may be saved by weakening the bichromate solution.

In some recent remarks on methods of removing air-bubbles that have formed between the gelatine film of carbon prints and the paper support, Baron Szretter said that if the prints affected were laid in boiled water the water would absorb the superfluous air from the picture, which would then lie smoothly upon the support. This Dr. Eder disputed in his last remarks on the subject, saying that as, according to Bunsen, the co-efficient of absorption of water at 18° C for air was 0·017, a great quantity of boiled water would be required for the absorption of even a single air-bubble.

Baron Szretter now retorts that he is tempted to think Dr. Eder has not considered the bearing and importance of the 0·017 he quotes; for, as one litre of water contains 1,000 c.c., the number 0·017 given as the absorption co-efficient of water for air would denote that one single litre of water is capable of dissolving 17 c.c. of air, or a volume about equal to the contents of a liqueur glass. Suppose, then, a glass plate with a carbon print adhering to it to offer a surface of one metre square, the air imprisoned between them could not exceed two or three cubic centimetres in quantity, even supposing the prints to be covered with air-bubbles; one litre of boiled water would be perfectly sufficient to remove the bubbles from several such pictures. Any one can easily find out for himself the practical truth of Baron Szretter's assertion; for, he proceeds to say, that having daily to develope hundreds of carbon prints he does not throw away those that are blistered, but saves them by placing them in boiled water, where, *not after a long time*, as Dr. Eder thought possible, *but in the short space of ten minutes, all air-bubbles disappear.*

Baron Szretter is extremely astonished at the non-success of Dr. Eder's experiments, especially as he is a chemist, and sees no way of accounting for his failure unless it be that he used boiled water, which he stored in an open vessel so that it had free access to the air of the room, and so had become saturated again with air in a natural manner before the pictures were dipped into it; or else that the picture had been placed in the water with the support lowermost and the picture film turned upwards. It is important to observe that the plate should be placed in or over the vessel containing the water with the gelatine film downwards, and in such a position that the plate cuts off the water from the outer air, and so compels it to be satisfied with that which comes in contact with it, viz., the air contained between the film and the support.

During the summer months photographic journals usually teem with *infallible* remedies for blisters in albumenised paper; and, although other crops may fail, the crop of specifics has been garnered as usual. The latest gathered formula is the following, taken from the *Photographische Notizen*:—"On removing the prints from the toning bath wash them several times in pure water; then place them, one by one, if possible, in a bath containing three or five grammes of pure muriatic acid to a litre of water. Here let them float, moving them about for a few minutes; then wash them further for two or three minutes in pure water to remove the acid. On warm days the operation should last longer than on cold. The prints are then placed in the fixing bath. In those rare cases when the finished prints have a slightly yellowish tone after removal from the acid bath they should be first put for a couple of seconds into a solution of five grammes of ammonia in a litre of water; then washed once and placed in the hyposulphite of soda bath. In this way any alteration of tone is rendered impossible."

RESINS IN COMBINATION WITH CHROMATES.

Most resins are known to be more or less sensitive to light; that is, by exposure to light they become insoluble or difficult of solution in their ordinary solvents, and in consequence of this property they are suited for the production, by light, of pictures upon stone and metal, which can be subsequently converted, by etching, into printable *clichés*. For the production of these etchings asphalte finds the most constant employment, because the properties of sensitiveness to light and capacity to withstand the action of acids are most conspicuous in this resin. Still the sensibility is too weak, so that two hours of an exposure in the direct sunlight, and a whole day in diffused light, would be required to produce properly-developed asphalte pictures either in the line or stippled manner; thus it is easy to understand why this method has been completely abandoned in favour of those in which the aid of chromate salts is invoked.

Whether or no such methods as have already been developed through the use of the chromates satisfy all present requirements in the way of transfers, I am convinced that, where what is required is not a transfer from paper to stone or metal but the direct production of the picture upon the stratum to be etched, much finer results will be attained. By this method reductions of wood engravings to one-third or one-fourth can be produced, excellent as regards sharpness and exactitude in the details. This circumstance moved me to take in hand new experiments with resins, in order to find a means of shortening the long exposure which renders the resin method impracticable. This means I found in the combination of the bichromate salts with those resins which are soluble in caustic ammonia.

That, by lighting, the bichromates would render the resins (which are, of course, organic matter) insoluble could easily be foreseen; but it was by no means such an easy matter to produce an intimate union between these two substances. As most resins are only soluble in etherated oils, and in alcohol no mixture could be produced between these and an aqueous solution of a chromate, it was, therefore, necessary to find a solvent common to both substances.

As you are aware, many resins may be dissolved in solutions of borax, of the caustic alkalies, of the alkaline carbonates and soap, and also by caustic ammonia. All these solutions of resin may be combined with bichromates; but they are not all suited for our purpose.

The addition of a bichromate will neutralise the resin in all of these solvents, and thus diminish their sensitiveness to light. Caustic ammonia alone has the rare property, when in combination with a chromate in neutral solution, of leaving, when dried, the sensitiveness of the preparation unimpaired, by giving off by evaporation one equivalent of the caustic ammonia and leaving behind in the preparation a bichromate possessing the property of sensitiveness to light in the highest degree. If, therefore, shellac, colophonium, dammar resin, or several other resins be dissolved in caustic ammonia, to which a little spirit must be added, and if with this solution, containing three or four per cent. of the dry resin used, carbonate of ammonia be mixed, one has the desired sensitive resinous compound, which, when poured upon stone or metal plates and dried in the dark, gives a film which resists the action of acids, and the parts of which that are unlighted under a negative remain soluble in spirits and in alkalies. The lighted parts, on the contrary, are soluble neither in the caustic alkalies, in alcohol, in turpentine, or in benzine; so that when the picture has been sufficiently developed and dried the image can be conveniently etched.

—*Photographische Monatsblätter.* J. Husnik, *Prof.*

Meetings of Societies.

GLASGOW PHOTOGRAPHIC ASSOCIATION.

The opening meeting of the session 1877-78 of the above Association was held in the Rooms, 172, Buchanan-street, on Wednesday evening, the 12th inst., there being a good attendance of members. Mr. George Mason occupied the chair.

The Secretary read the following

ANNUAL REPORT.

We have to report that during the past year ten meetings have been held. The attendance was well kept up, members evidently taking an interest in all that was brought before the meetings.

The Council have again to press upon the members the necesssity of giving all the assistance in their power by contributing papers and bringing forward anything which would be of interest. The Council is greatly indebted to those gentlemen who have supplied papers and otherwise contributed to the instruction and amusement of the members.

At the first meeting Mr. Urie read a paper *On Spirit Drawing.*

At the second meeting an excellent address was delivered by the President. There was a large number of pictures, executed by the Woodbury Company, exhibited. Mr. Jabez Hughes and Mr. Tunny were elected honorary members.

At the third meeting Mr. Henderson, of Perth, read a paper *On Modelling.*

At the fourth meeting Mr. Smithells read a paper on *Odds and Ends*, and Mr. James McGhee read one on the Vidal pictures.

At the fifth meeting a large number of pictures from the Edinburgh exhibition were exhibited, on which occasion a number of Edinburgh friends were present.

The sixth meeting was devoted to conversation, and was very interesting.

At the seventh meeting Mr. John Urie, Jun., read a paper on *Photography as an Aid to the Arts and Sciences.*

At the eighth meeting there were two short papers on carbon patents, and a committee was appointed to look after the Swan patents. That committee had a circular printed and circulated widely, and it is believed to have done some good.

At the ninth meeting Mr. Parker read a paper on *Personal Experience in Outdoor Photography.*

The tenth meeting was one of a popular character, the members and their friends enjoying an exhibition by the oxyhydrogen lantern, and a lecture, Dr. J. Nicol, of Edinburgh, being the lecturer.

In submitting their report, and believing the past two sessions have been productive of much good, the Council hope the future session may prove to be even better. To accomplish this each member is expected to do his best.

The minutes of the previous meeting having been read and confirmed, the election of office-bearers for the new session was proceeded with, the undernoted gentlemen being ultimately chosen to fill the various posts:—*President:* Mr. John Smart.—*Vice-Presidents:* Messrs. Mactear and Parker.—*Treasurer:* Mr. George Bell.—*Secretary:* Mr. Archd. Robertson.—*Assistant-Secretary:* Mr. P. M. Stevenson.—*Auditors:* Messrs. Mactear and Parker.—*Council:* Messrs. Urie, Dodd, Gilfillan, White, Smithells, and Johnson.

As far as possible arrangements for meetings during the incoming session were made.

A discussion, opened by Mr. George Bell, arose as to the propriety of the Association procuring a lantern, to be kept in the room of meeting, for the purpose of giving members an opportunity of exhibiting any transparencies they might wish to show, and thereby secure the verdict of members present as to their merits or demerits, it being thought that valuable information might be elicited in this way as to the best means of producing first-class transparencies.

The Chairman kindly offered to give the use of a lantern or sciopticon on any night it might be wanted, and also to exhibit transparencies, promising to bring forward anything new or novel in that line whenever received by him.

The offer was heartily accepted by the Association, Mr. Mason receiving a warm vote of thanks for his kindness.

The merits of Mr. M. Carey Lea's collocine restrainer was then brought up, the members however being almost wholly unanimous in saying that its restraining action was far too energetic, the results got by its use being, in almost all cases, negatives of a seemingly under-exposed character, though it was known that quite sufficient time to produce a fully-exposed negative was given. Those who had tried it had been glad to go back to their old and reliable formulæ.

A number of "photo-tint" specimens of the work of Messrs. H. M. Wright and Co. were handed round for inspection, criticism and explanation as to the mode of production being invited.

Mr. Dodd explained at some length a plan he had seen employed at the Autotype works, by which like results were secured.

Messrs. Mactear and Urie also explained other methods by which pictures of a similar character could be produced.

Mr. Urie thought the specimens of mechanical printing then before them the best that had ever come under his observation; and proposed that a vote of thanks should be passed to Messrs. Wright and Co. for the pleasure the examination of their pictures had given to the meeting. This was seconded by Mr. Mactear, who, however, thought that if Mr. Stuart were to bring down his book of lichtdruck productions many of them would be seen to rival in beauty any of the productions then before them.

Mr. John Cramb was then elected an honorary member.

This being all the business, a vote of thanks to the Chairman brought the meeting to a close.

Correspondence.

THE "PERIPATETIC PHOTOGRAPHER" AND THE AUTOTYPE COMPANY.

To the Editors.

Gentlemen,—I was much pleased with the sound advice given to the Autotype Company by the "Peripatetic Photographer" in a late number, and thought it was a good chance for the company of getting out of their perplexing situation, as they no doubt feel it to be, of having sold 363 licenses—say one-half of which for the Lambertype at £30 each, and the other half for the autotype patents at different prices. The sum must have been something handsome—perhaps many thousand pounds. Now to give up their assumed right to these patents, and to throw them open to the public, the company would be in honour, if not legally, bound to refund the whole of that money. But there is one thing I never could understand, and that is why the company charge £30 for the Lambertype patents, and at the same time acknowledge that the principal one is an infringement on Johnson's double transfer process. A satisfactory explanation on this point might again bring the company favourably before the public.

I would not have thought it worth my while to answer their letter had it not been for the implied sneer against the members of the Glasgow Photographic Association, showing how sore they are on the point, and the wrong impression conveyed. In point of fact the Society never made any move to oppose the company's assumed patent rights, but only formed a committee to oppose the renewal of Swan's patent, and were eminently successful in getting almost the entire sympathy of the profession, and sufficient funds were raised to oppose any attempts the company may have made to again saddle the trade with any such monopoly. Among the subscribers were some of the most eminent men in the profession, including many of the autotype licensees.

There is no doubt that the Glasgow Photographic Association deserve the gratitude of the photographers of this country for preventing the quiet renewal of this patent (which is the principal patent connected with carbon for the single and double transfer processes), and also that for the manufacture of carbon tissue, which will have elapsed on the 29th of February next, when we may expect an impetus will be given to carbon printing by the competition among tissue manufacturers to produce the best material only.

It is to be hoped that some workable system may be discovered, so that it can be adopted by the trade for small as well as for large work by the single transfer process, so successfully carried on by the Autotype Company, by Messrs. Annan and Skelton, of Glasgow, and by Messrs. G. W. Wilson and Co., of Aberdeen, whose enlargements are by far the finest that have come under my notice.—I am, yours, &c.,

83, *Jamaica-street, Glasgow,* John Urie.
September 18, 1877.

THE PHOTOGRAPHIC ARTISTS' CO-OPERATIVE SUPPLY ASSOCIATION, LIMITED.

To the Editors.

Gentlemen,—We claim your permission to reply to the letter in your last issue from "A Dealer," because such a communication, containing many mis-statements, to say nothing of an unwarranted attack on the private interests of our firm, might lead to much misconception of the intention of the above-named association, besides possible injury to our own business as at present carried on.

We pass over "A Dealer's" query as to whether the uranium (or any other) dry-plate business, or process, is saleable or unsaleable, &c., with these remarks, namely, first, that important modifications in his process *were* introduced as improvements by Colonel Wortley subsequently to the publication of his formulæ; and, secondly, that our manipulation and preparation of the uranium emulsion differ materially from that of any published process. We say no more on this point, because we feel sure that a communication from Colonel Wortley himself will settle the question of secresy.

We may now correct "A Dealer's" ideas on the other points of his letter. He states that it is proposed by the P. A. C. S. A. to purchase a process at £2,000. This is altogether wrong. A process does not constitute what is to be sold, nor £2,000 the value to be paid. The latter is to be paid *wholly* in shares. The former is only part of a good business in full working order, the value of which is established by a connection of many hundreds of customers, greatly increased since the acquisition by us, from Colonel Wortley himself, of the uranium dry-plate business in 1874.

As to the *intrinsic value* put upon our *process* by "A Dealer," "in view of other processes already worked commercially," we hardly think that "A Dealer" can be a fair judge of it. Our patrons testify differently. "A Dealer" may possibly obtain a larger discount from other manufacturers.

Allow us to further call attention to the fact that the directors of the P. A. C. S. A. are to receive *no remuneration until five per cent has been paid on the paid-up capital of the association,* and then *only* what may be voted at a general meeting by the shareholders themselves. So much for the "well-paid directors" &c.!

The last paragraph in "A Dealer's" letter exhibits so much bias as to show a mind groaning with jealous dread lest the association should prove a success, rather than one having any real anticipation of its failure.—We are, yours, &c., Chambers and Co.

251, *Goswell-road, E.C., September* 19, 1877.

To the Editors.

Gentlemen,—As an amateur photographer allow me a short space to counteract some observations in your last, signed by "A Dealer," which I consider unfair to this new enterprise and the promoters of it. I for one wish the association every success. I have been victimised both in the cheap and dear markets, and I can only look on this project as a boon to myself and others.

The merits of co-operation and joint-stock enterprise are well known. Good management and responsible direction generally ensure success. What, then, does "A Dealer" insinuate? In fairness to the firm alluded to in the prospectus as being incorporated with the new association, I may be allowed to say that, from a long acquaintance with them, I consider their name a sufficient guarantee, in any case of the kind, for upright and straightforward dealing. I enclose my card. I am, yours, &c., A Lover of Fair Play.

September 19, 1877.

[In future, this being a purely commercial subject, we shall expect any further correspondence to be accompanied by the name of the writer *for publication*.—Eds.]

GELATINO-BROMIDE.

To the Editors.

Gentlemen,—With reference to the letters of "E. D." we need say but a few words. We are unable to determine whether their predominant feature be real or assumed ignorance or obstructiveness. The car of progress is not "Juggernaut," nor England India; why should "E. D." immolate himself? Those who emulate the governing idiosyncracy of that hero of romance, Don Quixote, should wear the mantle of true heaven-born gentility which graces him under all *aliases*. Whether he be "Don Quixote de la Mancha," "The Knight of the Woeful Figure," or "The Knight of Lions," he is ever "nature's true gentleman," and this one attribute redeems the whole catalogue of his follies. Let "E. D." take this to heart. "E. D." has erstwhile appeared to some advantage when writing under the responsibility of his name. It seems a pity he should have, for this occasion, abandoned its restraining influence.

And now, with a feeling of acute pleasure, we turn to do friendly battle with your correspondent, Mr. G. Morton. This gentleman has tried our method, has not succeeded to his satisfaction, and thinks it no better nor more expeditious than the washing method. This is criticism honest, straightforward, and manly, and in like spirit we meet it. Let Mr. G. Morton imagine for one moment the sun (not merely arrested in his course as once in the days of old) put back a few weeks, and the present time be July, with its attendant temperature. He has compounded a gelatino-bromide emulsion, and the period of digestion is past. How will he extract the soluble nitrate? By the washing method he will experience great difficulty, if, indeed, the difficulty be not insurmountable. Suppose he has succeeded in getting the emulsion set in the dish, he must then use a quantity of ice in his washing water, and even if, after all, the nitrates are extracted, it is still questionable whether the gelatine will not suffer from decomposition ere his plates are dry. Time is a grand element in gelatine work; a few hours one way or the other have a commanding influence on the finished result. Here, then, our method is of particular value; it presents no trouble, curtails the time, and, since alcohol has some influence in preventing decomposition, it materially diminishes the chances of its being "set-up."

Anyone can, at this time of year, compound an ounce of gelatine emulsion, and, when ready, pour it out to "set" and get it washed in two hours; but does one always want to make single ounces of gelatine emulsion, and are we desirous of *making* each time we have to prepare plates? Here, again, our method asserts its value. By it we can prepare one or twenty ounces with equal facility. We can use part for present need and store the remainder for future use. This is the way to make gelatino-bromide pellicle.

To those who think our method ineffective we say—the point is one admitting of simple mathematical demonstration, and figures can generally be relied on as a precise method of proof. We claim for it especial usefulness in hot weather; equal applicability for large and small quantities; that it is scientific in principle and convenient in practice, dispensing, as it does, with the necessity for the employment of large dishes and cisterns of cold water; and we are unaware that it has one drawback which is not equally applicable to either of the two other methods extant.

We fear to trespass further on your space or we could write many words in condemnation of the practice of adding organic matters to gelatine. Gelatine is organic enough, and we hold that any further additions are utterly unnecessary, if not actually baneful.—We are, yours, &c., Wratten and Wainwright.

38, *Great Queen-street,*
Long Acre, September 17, 1877.

P.S.—We notice in our last communication, page 436, fifth paragraph, lines twenty-eight and twenty-nine, we employed the terms "solution" and "suspension" as synonymous. The latter, too, is redundant to the sentence. Nitrate of ammonium being in solution is necessarily in suspension, but it does not follow that a substance in suspension is necessarily in solution. The question of "solution" is one of absolute intimate union; that of "suspension" is one of specific gravity.—W. and W.

CARBON PRINTING.

To the Editors.

Gentlemen,—I cannot for the life of me imagine what Mr. Witcomb is "trailing his coat" for. I certainly never "rapped his knuckles;" and as to friend Foxlee nobody possesses the *suaviter in modo* to a greater degree than that worthy gentleman. And what is it all about? Mr. Witcomb gives us two items of information. One is that you are to let your print "remain in water for at least two minutes" after peeling off the paper. Well, this is news, truly! as if any carbon printer worth his salt ever *did* begin to wash up his picture *as soon as* he had peeled off the paper.

From the very first inception of carbon printing the importance of dissolving off the unaltered gelatine with the greatest care was always specially insisted upon. Mr. Johnson, in the first edition of the *Autotype Manual*, gives particular directions upon this point, and even advises that, to avoid damage to the half-tones, the plates should be left to develope themselves in a vertical grooved box filled with warm water. Mr. Witcomb will pardon me for saying that he seems to be scarcely aware of what has been the practice years before he adopted chromotype.

With respect to the strength of the bath: really it amounts to very little. Mr. Witcomb uses his bichromate solution of the strength of one to eighteen or twenty, and the *Autotype Manual* gives one to twenty, twenty-five, or thirty; but Mr. Witcomb gives us no *data* for comparison, as he omits to mention the time of immersion of his tissue—a point of some importance. The most extraordinary thing about his practice is that he sensitises "over night, and only for the next day's consumption;" and if he sensitises too much he "throws it away." So much the better for the tissue maker, say I; but as you, gentlemen, have very admirably pointed out, tissue improves by keeping.

In our works we make sensitive tissue twice a week in the summer and once a week in winter; and I should imagine that it would be far more convenient to a photographer to sensitise his tissue (say) twice a week on a bath of moderate strength—say three or three and a-half per cent.

Tissue is very much improved by keeping at least forty-eight hours after being made sensitive. It more perfectly preserves the half-tone; and, if dried with a reasonable amount of care, will be perfectly good and workable any time within ten or twelve days. Should there be any doubt about its sensibility a small strip placed on a test negative will settle the question in a few minutes; and, if cut up into the proper sizes and placed in a flat tin tray with a heavy lid to drop inside, it will always be handy, ready for use, and vary but little in sensibility.

Mr. Witcomb will, no doubt, come to the conclusion that they (the Autotype Company) "don't know everything down in Judee." Well, perhaps, we don't—in fact, I am sure we don't; but, considering that it is but a few brief months since he himself entered upon the upward and somewhat thorny path of chromotypy, I am not quite sure that even his doughty sword has slain all the difficulties in the road.—I am, yours, &c., J. R. Sawyer.

Autotype Works, Ealing Dene, September 19, 1877.

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Photography in Court.—At the Worship-street Police Court (London), on Wednesday, the 12th instant, George Mornington, bookseller, Sidney Symonds, a painter, Charles Seymour, a carman, and Alexander Hyams, were charged on remand, before Mr. Bushby, with having been concerned in stealing and receiving a case containing 162 dozen books of photographic views, value £60., the property of the Great Eastern Railway Company. Mr Frederick Moore prosecuted on behalf of the company. Mr. Grain defended Seymour. Mr. B. J. Abott appeared for Symonds and Hyams; and Mr. Rushley defended Mornington. Early in the month of August some packages of photographic views were stolen from the goods station of the Great Eastern Railway at Bishopsgate. Each package contained three dozen books of views, and the whole package stolen made up a total of 162 dozen books of views. No trace of the lost parcel was discovered until the afternoon of the 4th inst. Police-constable 367 K, while on duty in High-street, Whitechapel, saw the prisioner, Mornington, with a barrow and board, and on the board exposed for sale were a number of books of views and a quantity of photographs. The loss of the property having been made known to the police, the officer examined the views, and, finding they answered the description of the stolen property, he took Mornington into custody. Subsequently he went to a shop that prisoner occupied in Cannon-street-road, St. George's East, and made a search. Three packages, each containing three dozen of the views, were found in the shop, and two more packages in another place. Mornington said he had purchased them from Seymour, who was a greengrocer, in St. George's-road East. An inspector of police employed by the Great Eastern Railway, with other officers, made inquiries, and Seymour was then stated to have said he purchased only three for his children to play with. These, he said, he had got from a Mr. Inchbold, a drysalter, of St. George's. Inchbold gave evidence that he sold the whole case of about fifty packages to Seymour. He (Inchbold) had been applied to by Hyams to purchase a case, Hyams stating that he had bought them as a job lot. Hyams he had known some years, and Inchbold, after ascertaining that he could sell them again, bought the case from Hyams for £3, and Seymour gave him £4 for them. Hyams was taken into custody, and first of all said he knew nothing of the goods, and afterwards that he should reserve his defence. Symonds, it appeared, had also had the goods passed through his hands, and, like Inchbold and Seymour, had made a little money by the transaction.

Symonds and Seymour said that they merely acted as commission agents.—Mr. Moore asked for a remand to enable him to trace the actual thieves, and Mr. Hannay granted the request.—Bail was allowed for all the prisoners.—Hyams was said to be a discharged and pensioned soldier of the Royal Artillery, and had three medals showing that he had fought in the Crimea and India.——The case was heard a second time on Wednesday last, the 19th inst., when, some additional evidence having been given, Mr. Hannay remarked that the circumstance against the prisoners appeared to be that they had all made something out of the goods, and that the highest price given for them was £6 15s., although the value was said to be £60. He then committed all the prisoners for trial, but consented to admit each to bail in £100.

EXCHANGE COLUMN.

A Cleary's burnisher, imperial size, offered in exchange for studio furniture, or stereoscopic camera and lenses. Difference adjusted.—Address, W. Currey, 27, Bark-street, Bolton.

Wanted, a *carte-de-visite* lens, for which first-class fancy portrait frames and pictures are offered.—Address, J. Wilson, 5, Keith-terrace, High-road, Lee, London, S.E.

I will exchange a whole-plate camera and lens in good condition, also a quarter-plate camera and lens, bellows body, and large bath, for a half-plate camera and lens by a good maker, bath for half plates, stereoscopic camera, and pair of lenses.—Address, S. Sidey, 419, Kingsland-road W.

ANSWERS TO CORRESPONDENTS.

Photographs Registered—

Marshall Wane, Douglas, Isle of Man.—*Four Portraits of John Keen.*

James Fitzgerald, Kidderminster.—*Portrait of Arcangelo Corelli, from an engraving.*

William Shirrell, Birmingham.—*Six Views of the Rev. Charles Vince's Monument.*

Peter Adolphus Kent, Swansea.—*Photograph of Illuminated Address to the Venerable John Griffiths.*

☞ *Correspondents should never write on both sides of the paper.*

Notice.—Each correspondent is required to enclose his name and address. although not necessarily for publication. Communications may, when thought desirable, appear under a *nom de plume* as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

methods found by experience to possess greater advantages.

Falmouth Photo.—The morphine process has been superseded by other methods found by experience to possess greater advantages.

D. O. Z.—We have now been authoritatively informed that by the rescinding of the first agreement the youth is at liberty to do as he chooses, provided no fresh agreement has been made.

J. W.—For enlarging purposes a portrait combination will answer admirably. The posterior lens must be turned nearest to the negative to be enlarged. We have, however, seen very fine enlargements produced by means of a landscape lens.

Undergraduate.—Why trouble yourself about an organifier? Try an emulsion containing nothing except pyroxyline, bromide of silver, ether, and alcohol. If the pyroxyline be of a suitable kind—and in this lies the secret of success—you will obtain an emulsion leaving nothing to be desired.

Edward Barnes.—It is impossible to inform you what curves must be adopted without the refractive index of the glass being previously ascertained. This is more than we could undertake. It will be better to state your requirements fully to the optician, and consult him as to the best manner of carrying them out practically.

Transfer.—1. Employ strong acids at a low temperature.—2. Ordinary collodion may be rendered suitable for transferring purposes by adding sufficient tough pyroxyline to give it a suitable consistence, together with a little castor oil. The precise quantities and proportions must depend entirely upon the state of the collodion on which you are to effect the alteration.

Photolitho.—Although no intimation has been made respecting giving a medal for the best photolithograph at the forthcoming exhibition, yet, as three extra medals have been placed at the disposal of the judges to be awarded for anything which, in their estimation, may merit such distinction, it is not improbable that an award may be made for photolithographs if they were found to be of a fine quality.

B. S., Amateur.—1. It is of no consequence how high the building be that is at the sitter's end of the proposed studio. What is of importance is to have the camera end of the studio free from any lofty erections so as to permit a large flood of light to fall upon the sitter.—2. To clean off the varnished collodion negative films from glass plates, place some water and a large quantity of washing soda in a frying-pan of sufficient dimensions; allow it to boil, and then immerse the plates one after the other, letting them remain immersed for a few seconds. This will loosen the film in such a degree that by passing a stiff brush lightly over the surface the glass will be left quite bare. Each plate, after undergoing this treatment, should be placed in a vessel of clean water.

Geo. Macdonald.—The quickest tannin (bath) process with which we ar acquainted is the following:—Let the collodion be iodised with two grains iodide of cadmium and eight grains of bromide of cadmium. The silver bat must be one containing eighty grains to the ounce and slightly acid. Aft immersion for ten minutes the plates must be thoroughly washed in distille water, and then receive an application of a ten- or twelve-grain solution tannin, which must be washed off again. Plates thus prepared will keep fo several weeks and be quite as sensitive as wet collodion plates. It is necessar to observe that an alkaline developer must be employed.

C. P., writing on a subject that is well deserving of more attention than i has yet received, viz., the attaching of photographs to the leaves of an albun or scrap-book, says:—"Kindly inform me through your Journal if there b any method of improving the look of prints that are mounted in an ordinary scrap album. It always seems to me that prints thus mounted stand at a great disadvantage as compared with those mounted on cards, as they (the latter) can be rolled or manipulated as desired. Not so, however, with those mounted on the leaf of a book, as, of course, rolling would be quite inadmissible. I should like to know some method of giving them a better finish, as they always appear very crude, when simply 'stuck on,' to use a plain expression. Also, I have often thought it would be very convenient if by some means it would be possible to transfer or, perhaps, I ought to say develope a single transfer carbon print direct to a leaf of an album, without the intervention of the paper on to which they are usually developed. Of course the difficulty is to develope the picture without immersing the leaf bodily into water, which would, of course, ruin it. I may remark, *en passant*, that my experience with reference to spots in emulsion agrees with yours—that they are prevented by drying with heat, though I had not noticed it until pointed out by you."——In reply:—"C. P." has stated a difficulty in the mounting of photographs in the scrap album that has been felt by many. Some have complained of the puckering which takes place when paste is used as a mountant; this may be obviated by the employment of a solution of india-rubber, or even of gelatine, containing a large proportion of alcohol. If means were devised for transferring carbon prints to the pages of a well-mounted scrap book it would be a great boon.

Favente Phœbo.—A correspondent, under this signature, asks us or any of our readers to inform him "what is the difference between carbon printing, chromotype, and Lambertype." He says:—"I am an amateur dabbler in carbon printing, and have been so from early days, and reading the Journal pretty regularly I am fairly up in what is doing; but I cannot for the life of me understand what is the difference, which it seems is assumed on all sides to exist. None of my friends can tell me. I bought the three Lambert patent specifications, and have carefully read them in the hope of some enlightenment; but I am as far off as ever. With the exception of a method of doctoring photographs by means of working on transparent paper back and front of a *cliché*, there is literally nothing but a mass of unmeaning, fragmentary verbiage—no method of printing, no formula for tissue, no directions, in fact, for guidance. Something is said about a photometer, but it would be easier to invent one outright than to puzzle oneself in unravelling the incomplete statements in the specification. I beg pardon for omitting one broad but startling statement which occurs more than once in the specification, namely, that by adopting the things specified no artistic talent is required to produce artistic results. I desire, however, to be in no way understood as making the foregoing remarks in hostility to the Autotype Company, who, it appears, are owners of the Lambert patents. To that company I consider photographers, both professional and amateur, owe a deep debt of gratitude for the impulse they have given to progress in carbon printing, and for the very liberal spirit they have throughout evinced in connection with it. I trust they will find that substantial reward to which they are fully entitled."——We are a little at a loss what to say by way of reply, knowing that our correspondent is as able a lawyer as he is clever as a photographer. Will any reader supply the required information?

Received.—John Nicol, Ph.D.

The Photographic Exhibition.—We remind those who are about to exhibit pictures or apparatus at the forthcoming exhibition of the Photographic Society of Great Britain, that all works intended to form a portion of this annual display must be sent in by the 2nd of October, as the exhibition is to open on the 9th of that month. Further particulars will be ascertained from an announcement in our advertising columns.

METEOROLOGICAL REPORT.

Observations taken at 406, Strand, by J. H. Steward, Optician.
For the Week ending September 19, 1877.
These Observations are Taken at 8.30 a.m.

Sept.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks
13	30·04	SW	58	61	67	51	Cloudy
14	29·95	W	61	64	68	59	Cloudy
15	29·78	WSW	60	65	66	59	Cloudy
17	30·29	N	50	55	60	48	Cloudy
18	30·34	NE	50	53	60	51	Cloudy
19	30·12	N	54	57	61	52	Cloudy

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 908. Vol. XXIV.—SEPTEMBER 28, 1877.

EMULSION PLATES IN THE STUDIO.

Emulsion photography has now arrived at such a stage of perfection for outdoor work that the question may reasonably be raised as to whether it may not eventually supersede the ordinary wet process for general portraiture. The question has indeed been already raised; but, though many who have had practical experience of the capabilities of wet emulsion plates seem inclined to answer in the affirmative, the great majority of photographers certainly hold the opposite opinion. It is beyond all doubt that plates prepared in this manner are fully competent to enter into competition with ordinary wet plates, both in point of rapidity and in quality of result; but other matters have to be considered ere the new method can hope to secure any great amount of favour at the hands of the profession.

Chief amongst the matters in doubt may be reckoned facility of preparation and uniformity of result. By facility of preparation we mean preparation of the emulsion, for it cannot for one moment be denied that the manipulations connected with emulsion plates are infinitely more simple than with bath plates, if we take into consideration the trouble involved in the management of the bath; yet, if that simplicity be gained at the expense of a more complicated and, perhaps, uncertain series of preceding manipulations, the advantage is more than counterbalanced, and the palm remains with the older and well-tried method at present employed. We cannot gainsay the fact that, to all appearances, up to the present time the general balance will be found in favour of wet plates; for the successful working of emulsions remains as yet in the hands of the few, and professional photographers, as a rule, exhibit a sublime indifference to, or ignorance of, its principles. At the same time we must bear in mind that emulsion photography is, to a great extent, still in the experimental stage; that what has been done and written up to now is the work almost entirely of the experimentalist; but that when the process shall be allowed to rest at a point and be subjected to a proportionate amount of steady, practical use, then, and not till then, shall we arrive at an adequate comprehension of its capabilities as a reliable method for everyday use.

One of the greatest, if not the greatest, obstacle to its general adoption by the profession consists in the necessity for employing the alkaline mode of development. Without laying to the charge of professional photographers any suspicion of incapacity in grasping the principle of that method, it is an undoubted fact that they fight shy of it as an innovation upon what they have been previously accustomed to, and we have little doubt that if emulsions could be rendered equally amenable to iron development a great stimulus would be given to their adoption for portraiture. It is, of course, understood that iron or acid pyro. development *may* be used; but, under ordinary circumstances, the result is such a loss of sensitiveness that the plates at once lose all chance of competing with existing processes, or, indeed, of serving the purpose at all, hence we have endeavoured, with some degree of success, to so modify the circumstances as to remove as far as possible the objectionable features in connection with acid development.

It is already well known that bromised collodion sensitised in the bath yields plates of very great sensitiveness and of high quality with iron developer; but, then, the condition of the films differs most materially from those obtained with an emulsion. We have, then, to consider in what manner the conditions may be assimilated, so as to remove partially, if not wholly, the discrepancies in the results. It is obvious that the difference does not spring wholly from the presence or absence of free silver; for if an emulsion plate containing free silver be exposed and developed without washing, the result will be a thin, poor image, which it is impossible to intensify, though, perhaps, the sensitiveness may be all that could be desired. Without entering into the whole subject of the difference between the two forms of plates, which has been over and over again fully discussed, we will proceed briefly to detail the manner in which we have endeavoured to bring about a more satisfactory result.

The first method has for its basis an emulsion containing an excess of silver nitrate, amounting in our experiments to nearly four grains to each ounce. Such an emulsion used in the ordinary way with iron development gives an image incapable of intensification, the tendency to fog being insurmountable, however much restraining acid be used. What is required is a restrainer *in* the film, which shall operate without destroying to too great a degree the sensitiveness. This may be attained, no doubt, by a double coating, using as a substratum an emulsion containing excess of soluble bromide; but this method fails to commend itself for various reasons. We prefer to combine the restraining bromide with an ordinary substratum of albumen.

The employment of an albumen substratum with ordinary wet plates is in very general use in many of our best studios, so this can scarcely be considered as a complication, especially as it saves a great amount of trouble in polishing the glass; the only additional trouble consists in adding to each ounce two grains of bromide of *cadmium*. We recommend the cadmium salt for reasons which will become evident. Now, when a plate prepared with a preliminary coating of bromised albumen receives a second film of emulsion, the solvent action of the ether and alcohol causes the bromide to penetrate to a certain distance into the emulsion film; but, owing to the small quantity of soluble bromide present and the rapidity with which the emulsion sets, its action is confined to the back portion of the film. Bromide of potassium, owing to its very slight solubility in alcohol, is not to be recommended.

We thus obtain a film the surface of which contains free silver, while the portion underneath contains uncombined soluble bromide—conditions which are supposed to combine to give to Major Russell's plates their superior character as regards sensitiveness and freedom from fog. Plates prepared in the manner described exhibit with iron development a very high degree of rapidity without the tendency to fog of which we spoke earlier; but, unfortunately, there are drawbacks to the plan. Foremost stands the necessity for exposing and developing the plate without previous washing, which entails the use of a highly alcoholic developer or else the total immersion of the plate in a dish. Then, again, it is difficult to so arrange the proportions of bromide in the substratum and silver in the emulsion as to secure the full restraining action without destroying the sensitiveness; and, lastly, the action is liable to irregularity.

As a better method we recommend the following:—Let the emulsion be an ordinary washed one, of fair sensitiveness, free, of course, from any addition of tannin or similar substances; a bromised albumen substratum is employed as in the previous case, but it is immaterial what bromide is used. After coating the plate with emulsion it is immersed in a dish of water until the "greasy" lines disappear; during this operation the bromide permeates the film perhaps throughout its whole thickness, but it will require a prolonged soaking to wholly remove it. Immediately previous to exposure—that is to say, within a few minutes—the plate is flooded with a thirty-grain solution of silver rendered slightly acid, and transferred to the slide; it is then treated in every respect as an ordinary wet plate.

The result of this method is perfect regularity of action, and the behaviour of the plates is in no way different from bath plates. It is possible that the sensitiveness may vary slightly according to the length of time the plate is allowed to soak; but this holds equally good with regard to a bath plate and the period of its immersion in the silver solution, and, if the process be reduced to a system, need cause no inconvenience. It will be urged, no doubt, that this is a step backwards to the bath; but we think, upon due consideration, the difference will be evident. The plates are coated with emulsion and freed by washing from all traces of the volatile solvents; hence the silver solution (bath we will not call it) is not liable to become disordered, and while we secure the advantages of the bath we avoid the thousand-and-one troubles ordinarily connected therewith. The total absence of all volatile matter from the film enables the plates to be kept moist for a very much longer time than would otherwise be possible; in fact, we have the equivalent of a bath plate without its concomitant evils. The silver solution may be poured from a bottle or beaker, and is used repeatedly, merely requiring to be strengthened occasionally.

In conclusion: we may say that, from a trial of emulsion containing a small proportion of iodide, we are inclined to think that for this form of development it is likely to offer decided advantages; but of this we are not yet able to speak positively.

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AUXILIARY EXPOSURES *REDIVIVUS.*

It is now within a month of five years since we published an article, followed by several others, on certain experiments we had made, in conjunction with Mr. E. W. Foxlee, with a view to obtaining a reduction of the exposure in the camera, the means employed being the exposure of the plate to a very feeble, or preferably to coloured, light for a brief period after the legitimate exposure to the sitter. We placed on record the nature of the numerous experiments we had tried. From that article (vol. xix., page 515) we make the following extract:—

> "The experiment was repeated a number of times with papers of different colours and depths of tint. No matter what kind of paper and, therefore, colour of light was used the same effect was produced. Even white light employed under circumstances of special precaution acted the part of a developer of the latent image, and fitted it for the further action of the iron developer. Exposure to light through a coloured medium, as might have been supposed, produced the same effect. Too little exposure to coloured light produces no effect; too much produces fogging."

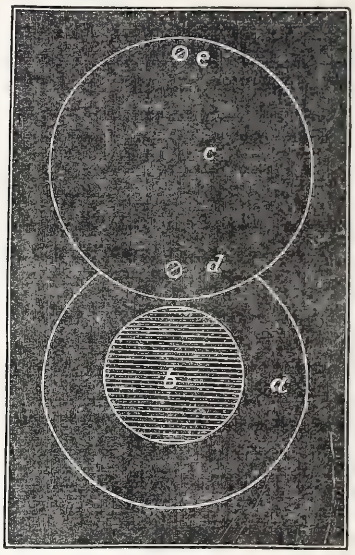
The experiment above recorded invariably yielded negatives of which it could be affirmed that the supplementary exposure gave an effect equal to a prolongation of that to the sitter.

Several methods of carrying into practical effect the principle of auxiliary exposures have since that time been propounded by ourselves and others, among these being the exposure of the plate to the light of a candle or gas flame in the dark room previous to applying the developer; the making use of a cap for the lens having in it an aperture filled with opal glass; and the making of a small window in the front of the camera containing a diaphanous body capable of admitting coloured light during exposure.

We have here to describe another method, now being introduced into this country by M. Scotellari, of Antwerp, who, however, has obtained a patent for his method. The latter consists in making use of a cap to the lens having in it an aperture glazed—if we may be allowed to use the solecism—with tissue paper of a violet colour. We have as yet no means of ascertaining from a perusal of the specification the nature of the claim made in connection with the invention; so, pending the time when the details in the specification can be made known to the public, we shall at present give such a description of the patent cap as will explain its nature to our readers.

In the ordinary cap of the lens there is cut a circular aperture. In one of those we saw the hole was a little larger than a half-crown. Over this aperture, in the inside of the cap, is pasted a piece of violet paper. The paper we saw appeared to be tissue paper coloured by one of the aniline dyes. There was a shutter to this little violet window, which shutter was quite opaque, so as to entirely prevent all access of light through the violet screen. This shutter rotated on a pin or pivot in the mode at one time peculiar to the shutters of foreign-made landscape lenses, and a small knob projected in such a manner as to enable the violet window in the lens cap to be itself capped and uncapped by the rotating shutter described, and which we illustrate by means of a diagram, which will serve at least to show the principle of action of the cap we saw used.

In the annexed diagram *a* represents a front view of the lens cap, which may be either of brass or leather; *b* is the circular aperture "glazed" with violet paper; *c* represents a thin opaque shutter which rotates upon the axis or pivot *d*, a little projecting handle at *e* enabling this rotation to be performed by the finger and thumb.



The method of using the cap is as follows:—The plate having been placed in the camera, the lens is capped, the circular shutter *c* is rotated so as to cover the aperture *b*, and the exposure is given by bodily removing the cap in the usual manner. *Less* than the usual exposure is given, and the lens is then capped. The operator now uncovers the violet window by rotating the shutter *c*, and allows it to remain uncovered for such a brief period of time as experience dictates to be best. When we saw M. Scotellari operate he rotated the shutter a few times so as to give a series of short exposures.

As we have all along said, there is no doubt that by the adoption of some such method as that here described the exposure of a plate may be considerably reduced. We have not yet, however, been able to discover any special virtue in *violet* paper; nor are we yet able to say whether the patent is obtained for the particular form of the circular shutter by which the violet paper window is covered and uncovered, or for making use, in the manner described, of paper instead of opal glass in the cap, or, in the latter case, of making use of paper of a *violet* colour in preference to that of a different colour. This will be revealed in due course when the specification is printed.

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THE USE OF TWO DIPPING BATHS.

There are, perhaps, no faults so common among negatives taken by the wet collodion process as, primarily, spots, streaks, comets, *et hoc genus omnes*, and, secondarily, fog. In the majority of cases there is no excuse whatever for their presence—their cause, cure, and their whole course of existence having been traced time after time, and the means of preventing them being as simple as easy of application. Naturally there do occur times and seasons when everything goes wrong without apparent cause; but such occasions are rare, and a little careful investigation—a little time spent upon "nothings"—will generally ead to the discovery of the cause of the evil, which is rarely occult, and can generally be traced to a little inattention to known causes.

The most fertile origin of these disagreeable accompaniments o carelessness and indifference, if we may not say unskilfulness, are he collodion and bath. To the former it is not our intention to allude n this article. We have in a recent one pointed out a common allacy with regard to the strength of the bath, and shown that t is not weakened by use to anything like the extent that is commonly supposed, and we incidentally alluded to the desirability of adopting the method which is indicated in the title of this article.

When a bath which has been used for the dipping of a few dozen plates is examined, the amount of deposit which lies at its bottom and the multitude of floating particles it contains are a matter of considerable astonishment; it does really appear marvellous that, with every care taken to keep the room free from dust, the plate well brushed before collodionising, and the latter done with care to avoid running over at the back or edge, which might end in loose pieces in the bath, with these and every precaution taken, the bath will yet be full of "bits" in a very short time. Every plate immersed and drawn out has upon its surface a share of these disturbing particles, and upon their greater or lesser magnitude depends the effect they produce. The finer particles produce an effect scarcely appreciable to the naked eye when they are not present in overwhelmingly large quantity; but the microscope or a hand magnifier will show them to have caused a pinhole, with sometimes an opaque radiation surrounding it. As they accumulate in amount—and that they do very quickly—the whole plate is marked with tolerable regularity, with numerous irregular-shaped holes (in this respect differing from pinholes properly caused by iodide in the bath), and the appearance of the plate generally is irregular and coarse, and wanting the characteristics of a good negative to a far greater extent than the mere presence of spots would bring about.

Concurrently with these spots, when the bath arrives at a bad stage bits of collodion will accumulate, and now and then make their appearance by adhering to some important point in the negative, their presence before exposure having perhaps been unnoticed in the pressure of work. We know of one celebrated metropolitan photographer who, with the double purpose of keeping his bath free from dirt introduced by plates and having spotless collodion plates, had constructed for him a large glazed cabinet, in which the operator thrust his arms, collodion, plate, and all while coating. No doubt his idea was excellent; but, in a conversation with one of his operators which we had some time ago, we have a lively recollection of the contempt he expressed and the conclusion we came to that neither this operator nor any of his *confrères* ever made use of the "cupboard" when his master's back was turned.

The truth is—it involved too much trouble; and for any method of manipulation at all out of the common we fear there are few who will put it into practice, when the principal's eye is not upon them, if there is any simpler method of evading what they call "that nonsense." Now, the double-bath principle is simplicity itself, the only drawback being that in being able to save the trouble of repeated filterings there is danger of the baths never getting filtered at all. With the single bath it is essential that filtration or clarification by subsidence be resorted to frequently, if anything like an average negative is to be produced. Of course, in establishments where fancy backgrounds prevail, a wretched, dirty negative may pass and not appear much the worse; but we hope that perfection in results is always aimed at, and whether a portrait subject with a pictorial background be in hand, or a landscape where the whole picture is so broken up as to hide any amount of spots, the photographer's desire should always be to produce a perfect negative.

We have seen, with the two-baths "method," the first bath worked down to one-half its bulk, without once being taken out of its holder, and yet perfect plates result. So small a proportion of the suspended matter is taken into the second bath that it remained in a state by no means perfectly clean, yet quite fit to give a clean negative. We do not advocate such extremes as this; but knowing the desirability of as little contamination of the bath as possible by repeated filtration, and the practical difficulty attending the clearing by subsidence, we see here one great advantage of the double bath. But in our mind its chief feature, beyond the utter reliability of the plates and their uniformity from beginning to end of a day's hard work, is the absolute freedom from all spots that can be ensured, with a tithe of the trouble ordinarily bestowed upon the solution.

Another especial recommendation in its favour is the power it gives us of making use of the advantage of a strong and a weak bath at the same time. On another occasion we shall refer to the peculiarities of a strong bath; but at present we may content ourselves with saying that a thirty-five-grain bath, for instance, will give a better plate than a twenty-five-grain bath, but that in hot weather, and for some class of subjects, it is found inconvenient to have a solution so strong as the former, with the chance of its drying upon the plate. We are, therefore, able to prepare our plates in the strong bath, and for a second bath have a weaker solution, according to our judgment, which will in no way interfere with the quality given to the plate by preparation in the strong bath, and will, further, give a great range in developing capabilities.

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If, as would appear from our recent experiments, the subject of spots upon dry-plate films is materially affected by the manner in which the plates are dried, it becomes necessary to give a little attention to that branch of manipulation in order to secure immunity, as far as possible, from spots on the one hand and drying marks on the other. No doubt there are many admirable forms of drying apparatus in use at the present time; but they are almost all designed for employment in connection with the older descriptions of plates, in which the films contain a large quantity of *aqueous* moisture, requiring, if not a great degree of heat, at least a considerable length of time and certain special precautions in order to bring about complete desiccation without unequal markings. These older forms of plates prepared with an aqueous organifier are all more or less subject to the evils of unequal drying, any sudden variation in the temperature employed or the slightest contact with cold air during the operation invariably telling its tale; but, in the case of films prepared from washed emulsion, the liability to unevenness in drying is greatly reduced, while the danger of spots of various sorts increases. The conditions being so far changed, it may be reasonably imagined that the means adopted to bring about the drying may be also modified with advantage. Certainly the common form of drying-cupboard —in which the plates are shut up for a lengthened period in a heated atmosphere—is not necessary, nor, indeed, omitting the question of necessity, is it to be recommended. What we principally require is a means of drying the film as rapidly as possible, the contact of dust or currents of cold air being guarded against as far as possible. The first condition—rapid drying—in itself tends to lessen the risk of the other two, whence it arises that a very common and, in our own case, favourite method consists in the use of an open stove or hot plate—open in the sense that the film is freely exposed to the air during drying. With ordinary care there is little fear of either dust or draughts attacking the plate, and the plan has the advantage that the hot plate or stove may be applied in connection with the "lantern" used as the source of illumination and the need of a second light avoided. Where the "boxed-in" system is preferred, we do not recommend that form in which heated air is admitted and allowed to pass over the surface of the films. It is liable, unles very great care be observed, to lead to both spots and drying-marks. A simple box or cupboard of sheet iron, provided with means of egress for the volatilised moisture and heated from the bottom, is much to be preferred. It may not work quite so rapidly as the *current* of heated air, but the results are much more uniform. The plates should, of course, be protected from contact with the heated metal by the interposition of a non-conducting substance—such as several thicknesses of blotting-paper, or, better, strips of thick felt. Those who desire a satisfactory drying apparatus for washed emulsion plates will find this simple arrangement to equal, if not excel, any of the more complicated forms.

THE LATE W. H. FOX TALBOT.

One by one our photographic fathers are departing. Following the other two members (Niepce and Daguerre) of that grand old trio to whom photography owes its existence, Mr. William Henry Fox Talbot, F.R.S., at the ripe age of seventy-seven, "rests from his labours," having died at his family residence, Lacock Abbey, Wilts, on Monday, the 17th instant.

Mr. Talbot was born in Dorsetshire, in 1800, and up to the age of thirty-three he passed his time very much in the manner one expects of a man of cultivated scientific and artistic tastes, and possessing the means of indulging in those tastes to the fullest extent. At that period it was customary for those who travelled abroad, and whose desire to make sketches of scenes met with in foreign travel transcended their ability to execute them skilfully, to carry with them a *camera lucida*—a small prismatic instrument which, when fixed to a table, enables anyone to draw with accuracy the particular scene to which the instrument is directed. It was when amusing himself in sketching, by the aid of this instrument, the scenery on the shores of the Lake of Como, in 1833, that Mr. Talbot first experienced a strong desire to make science a handmaid to art, and to find some means by which the beautiful transcripts of nature to be seen in the *camera obscura*—which instrument he also utilised in connection with art—might by chemical agency be made to record themselves, if not in colours, at least in light and shade. To accomplish this object Mr. Talbot set himself to consider whether it could be effected by any of the chemical processes then known. Now what, at that epoch, *was* known? Thanks to Scheele, certain properties possessed by chloride of silver when exposed to light had been discovered and recorded. Writing just one hundred years ago (*Traité de l'Air et du Feu*, 1777) that *savant* says:—"It is well known that the solution of silver in acid of nitre poured upon a piece of chalk and exposed to the beams of the sun grows black. The light of the sun reflected from a white wall has the same effect, but acts more slowly. Heat without light has no effect on this mixture." Scheele also discovered that it was to the violet and blue rays of the spectrum that this change was due, and not to the more luminous yellow or red rays.

Various applications of this discovery were made by Wedgwood, Davy, and others, the chief result obtained being the production of profiles upon white leather that had been washed with nitrate of silver, this being produced by allowing the shadow of a rigid body to fall upon the leather when placed in the sun. But no means of fixing these shadow pictures were known, hence the pictorial results of these two experimentalists had to be kept shut up in a drawer. At this stage of such peculiar scientific knowledge Talbot entered the field of research.

The various steps through which Mr. Talbot's earliest experiments were conducted may be summarised as follows:—First, he tried simple nitrate of silver solution brushed upon paper and dried, but this was found to darken too slowly. Next, he spread chloride of silver upon moist paper, but this also proved unsatisfactory. He then discovered that the best way by which to prepare chloride of silver was by double decomposition, the paper being first impregnated with common salt and afterwards with nitrate of silver. He discovered in the course of these experiments that in order to obtain the highest degree of sensitiveness with this preparation there must be an excess of nitrate of silver allowed to remain in the film. On paper prepared in this manner Mr. Talbot obtained numerous pictures of flat objects—such as leaves, lace, and analogous objects—by superimposing them upon the sensitive paper and then exposing them to light. But by means of a modification of this process—that is, by giving two successive coatings of chloride of silver with nitrate in excess, and making use of the paper while in a moist condition—images were at length obtained in the *camera obscura*, although a long exposure had to be given. This was accomplished in 1835, and an account of the experiment will be found in the *Philosophical Magazine* at that period.

Previous to this time some of the properties of iodide of silver had been investigated by Talbot, who did not then discover anything sufficiently tempting to induce him to continue in this line of inquiry. Up to 1840 other duties undertaken by Mr. Talbot pressed for attention in competition with his photographic experiments. Bringing to bear upon his researches into the primæval antiquites of Greece and Rome all the scholastic powers of a cultivated mind which had secured for him the wranglership in mathematics at Cambridge, and the Chancellor's medal in classics, he contributed much to philological and archæological literature. In 1839 the London newspapers and scientific periodicals contained accounts of Mr. Talbot's progress in securing the images of the camera. This occurred under the following circumstances:—In January, 1839, the discovery of the daguerrotype was suddenly announced to the world. It was accompanied by no explanation of the means employed, which were kept a profound secret. As there was some reason for supposing that it was the same discovery, or nearly so, as Talbot's, the latter, by the advice of his friends, immediately published his discovery in some of the leading newspapers of the day, the *Philosophical Magazine*, &c. He likewise exhibited a large number of pictures and other photographs at an evening meeting of the Royal Institution, and read a paper on the subject before the Royal Society on January 31, 1839, in order that, if the discovery proved to be the same, he might at least demonstrate that he was an independent discoverer. However, as everyone is now aware, it eventually turned out to be wholly different.

Talbot's great discovery was made on the 7th of September, 1840. By this discovery the whole aspect of photography was changed. The process was one to which the discoverer gave the name of the "*calotype.*" He found that, when the paper was impregnated with iodide of silver and excited with nitrate of silver and then placed in the camera, it was not necessary to wait until the image became *visibly* impressed, but that if removed from the camera in a state of apparent blackness, and without the appearance of the trace of an image, it would, if treated with a solution of gallic acid, disclose such image with a greater degree of force than if it had been exposed for many hours, the vigour of the image going on increasing under the action of this developer until at length it was sufficiently strong to print from. By this discovery the progress of taking views was accelerated upwards of a hundredfold; for, by an exposure of one minute a view could now be secured possessing as much vigour as that previously obtained after an exposure of two hours. Finding that fogging of the image was very apt to take place, Mr. Talbot traced this evil to its source, and, by the introduction of acetic acid into the developer and sensitiser, he overcame the difficulty.

By the calotype process—which, in honour of its discoverer, was afterwards designated "*Talbotype*"—portraits possessing great beauty were taken from the life, and we have now in our possession landscapes, studies, and views of various kinds which will bear favourable comparison with some photographs, at least, which have been adjudged worthy of a place on the walls of photographic exhibitions held within the past few years. In sharpness (although the negatives were taken not on collodionised glass, but upon paper), in brilliance (notwithstanding the prints were produced upon plain and not upon albumenised paper), and in tone (although the "toning" of photographs had not then been heard of), the early pictures of Mr. Talbot—those, for example, to be found in some copies of the *Pencil of Nature*—these early productions, we repeat, of this old master, when examined side by side with those of the present time, compel the admission that "there were giants in those days."

The *Pencil of Nature*, to which we have alluded, is a fine quarto volume, published by Longmans and Co., in 1844, and is, without doubt, the first work ever illustrated by photographs. It may be described as a series of twenty-four photographs of dimensions ranging from half plate to whole plate. The subjects are varied. Each picture has a descriptive chapter of letterpress, and there is an introduction giving an outline of the process employed and the steps which led to its discovery. On one occasion, when conversing with Mr. Talbot with respect to the fading of prints, we showed him our copy of the work in question, and directed his attention to the fact of several of these pictures having faded towards the margins while the middle portion was in excellent preservation. In reply to our question regarding the method by which the prints had been washed and mounted, Mr. Talbot informed s that after having been fixed in a solution of hyposulphite of soda hey were transferred to the first of a series of six or eight vessels of water, and after remaining in it for a short time, they were ransferred to each vessel in succession. With regard to the mounting: this had been done by a bookbinder, who employed the paste used in his trade, which contained a large quantity of alum, and this, generating acid, had eventually destroyed those portions of the prints with which it came in contact; for, by a fortuitous piece of luck, Mr. Talbot had instructed the bookbinder to paste the pictures to the mounts by the margin only.

In 1843 Mr. Talbot visited Paris, and demonstrated his process to artists and amateurs of the daguerreotype process, which was at that time becoming well known. For nearly two weeks Mr. Talbot gave an almost daily series of short lectures, accompanied by practical tuition in the new method of taking pictures. Numerous modifications of the original process were introduced by Mr. Talbot. For example: his camera process was, as we have seen, a *negative* one, from which negatives, by a species of chemical printing, positive proofs were taken on paper possessing less sensitiveness than was necessary for obtaining the negative. He set to work to discover a process by which positives could be secured in the camera by one operation. After numerous experiments he at last discovered the means by which this could be done, and of which the following is an outline:—A sheet of iodised paper is excited with nitrate of silver, and, when dry, is exposed to light for a moment. It is now immersed in a solution of iodide of potassium, and dried. After exposure to light for one or two seconds its whole character becomes changed, for if exposed to the action of a developer it would not darken as before. While, therefore, the paper has been treated with the iodide it is placed in a camera, and the light it there receives prevents certain portions—in proportion to the luminous action—from being blackened by the subsequent action of the developer, while other parts become black. The exceeding value of this discovery, upon which we cannot now dwell, will be apparent to every scientific reader.

Having discovered a very rapid albumen process upon glass, Mr. Talbot, in 1851, tried in the laboratory of the Royal Institution the following remarkable experiment:—A printed paper was fastened to a circular disc, which was caused to revolve very rapidly by means of suitable wheels and machinery, and a camera was so placed as to have this paper in its focus. The room was then darkened and the wheels set in motion; and when the disc was spinning round with the utmost velocity capable of being attained the camera was opened, and the large electric battery belonging to the Institution was discharged. (It has since been found that the duration of the light produced by the discharge of a Leyden jar is about the ten-thousandth part of a second.) Upon the photograph being developed it showed an image of the rotating printed paper quite sharp and clear, as if it had been motionless during the whole time of the exposure. We do not consider it necessary to give the details of the process by which the plate was prepared, suffice it to say that the albumen was salted with proto-iodide of iron, sensitised in a seventy-grain bath, exposed wet, and developed by a strong solution of protosulphate of iron.

Passing over a number of interesting researches we arrive at the last great discovery by Mr. Talbot—that of photoglyphic engraving. Recollecting what had been published in the *Transactions of the Royal Scottish Society of Arts* by Mr. Ponton, in 1839, with regard to certain properties in bichromate of potash, Mr. Talbot, in 1852, made experiments with a view of discovering whether, by means of a thin coating of gelatine and bichromate of potash applied to a metal plate, he could not produce a surface that would become hardened in some parts, so as to resist the action of an etching solution, remaining in other parts permeable by such solution. These investigations were crowned by the discovery of a singularly delicate and beautiful method of producing engraved steel plates, in which all the details were faithfully rendered. But this very delicacy and perfection prevented the process from coming into general use, owing to the great care required in the printing of impressions. However, it paved the way for other processes which are now employed commercially.

From what we have written our readers will perceive the important extent to which photography has been indebted to this veteran experimentalist.

Regarding his social life we have little to say. He was a decendant of a branch of the noble house of Shrewsbury. As a landlord he was beloved by his tenants, who never applied in vain to him for advice or assistance in their troubles. He was somewhat brusque in manner, but possessed a kindly heart. He seemed to prefer downright contradiction to anything that partook even of encomium; and when, in 1863, we first made his acquaintance, that trait in his character was developed to a most noticeable extent. In a manner that we thought decidedly "snappish"—and that at our first interview with him—Mr. Talbot almost *demanded* our opinion of a photoglyphic portrait of Sir David Brewster he had recently executed, inquiring whether we had ever seen anything finer. We had, many times. "Do you know," he almost thundered, "that Sir David Brewster, Mr. Cosmo Innes, and numerous other men capable of judging, have pronounced that to be the very finest engraving I have ever produced?" We replied that we did not care what were the opinions of these men—the picture was not the best that he had produced; not only so, but it was very, very far from being equal to others of his pictures—that, in point of fact, it was the worst photoglyph we had ever seen, scarcely reflecting credit upon the advance he had already made. He stared for a moment, as if totally unaccustomed to have his works criticised in such a rough fashion, and, after a few words, he explained that his own opinion entirely coincided with ours; the picture, in *his* estimation, was a very poor one, but we had been the first to have the honesty to say so to his face. And thus was the ice broken. We have now in our possession a very large packet of letters received from Mr. Talbot at various intervals since that period. When we last conversed with him we understood him to say that he either had been, or was about to be, engaged in experiments with a view to obtain photographs in natural colours. Alas! that "slow-consuming age" should have overtaken the venerable *savant* before he solved this problem; for no man was better constituted than the late Mr. Fox Talbot for undertaking investigations in heliochromy.

The remains of the deceased scientist repose in Lacock Cemetery. The funeral, which took place on Friday last, was numerously attended by the tenantry, tradesmen, and neighbouring gentry. All the shops in the neighbourhood were closed, and a muffled peal was rung as a last mark of respect to the lamented gentleman.

THE ART OF PAINTING ON THE PHOTOGRAPHIC IMAGE.

No. V.

A BLUE eye may be well represented by a little Prussian blue—that is, *in a photograph;* it would be too blue to use on white paper, except the eye be of a violet cast, when French ultramarine will be found to answer better, the reflected light being a little warmer or yellower. As regards the painting of hair: the real colour of the hair will only be found between the very deepest shadows and the bright bluish high light. For medium or ordinary brown hair a wash of neutral tint with a dash of sepia is a good, safe mixture; then, when quite dry, some sepia with gum should be taken rapidly all over the shadows. This should be done boldly—not stroked on, but in firm washes, the artist considering well what he is going to do and the shape of the shadow before attempting it, and then doing it rapidly and at once, or the colour underneath will come off, and result in chaos. The deepest shadows of all may then be touched in with some rich brown—say Vandyke; or, if the photograph be very black, burnt sienna, using plenty of gum. For flaxen hair raw umber is a good colour, warming up the shadows with orange chrome. For black hair use a general wash of neutral tint, then ivory black in the shadows, and for the deep touches gummy sepia. For the different shades of golden hair, mixtures of Roman ochre and burnt umber with Roman ochre and white for the lights will give excellent results. For auburn hair use burnt sienna with a little lake or yellow, as the hair leans towards chesnut or golden. Grey hair, if cool and silvery, is well rendered by French ultramarine and a little sepia or blue and light red, according to the tint of the hair. If it be yellowish-white add a little Roman ochre; and for iron grey ivory black and French ultramarine.

Having got the hair in well in masses, break it up here and there with a stroke of dark colour on the light, or a light stroke or two on the dark. A little stippling is often of great use in the hair, especially in a lady's hair; any amount of smoothness, gradation, and gloss may be got by it.

All white drapery should be toned down, as in a photograph it is almost always too white and wanting in detail. Nothing looks more hideous than to see the face in strong shadow on one side and the collar at the same side a staring white; yet it is generally so. The fearless darkening of the shadow side of the drapery with sepia or sepia and black will make that side of the face look lighter. Again: if there be a large surface of white a thin wash of black and a little gamboge should be passed right over it, and whilst wet a few lights taken out with a brush or wash leather. By doing so you get something to work on. The darker shadows should then be dexterously introduced, and, finally, a spark or two of white on the very highest lights toned down with a touch of Roman ochre. There are also often warm, reflected lights in white drapery; they are generally yellowish or greenish, unless some very brightly-coloured object be near, when they will partake largely of its colour.

With respect to the treatment of black drapery in water colour: if the photograph be a very excellent one, with good light and shade and detail in the drapery, a transparent wash of light Prussian blue will be found to suffice, the lights being touched with a mixture of black and white, and the deepest shadows with gummy sepia. The object of using a rich brown is to prevent sootiness and give transparency to the deep shadows. The putting on of these lights and shades requires the utmost attention to the guide, and they must be of exactly the right depth and form, or they will look like mere paint streaks; avoid lines. If the drapery be not so good, or if it be very much too light, as black drapery often is in photographs, a good strong wash of ivory black, Prussian blue, and neutral tint is excellent, using it not so thick as quite to hide the photograph, and more blue or neutral tint predominating according to the tint underneath, making the black greenish for a reddish photograph and purplish for one approaching the burnt sienna tint.

This killing of the tint of the photograph by tints approaching the complementary tint may require some little explanation. Black may be made of blue, red, and yellow mixed together. These are called the three primary colours, and if mixed together they neutralise one another and make blackness. If in trying to make black you get a tint a little too red, add more yellow and blue and it will turn black; so, if your photograph be reddish, make your wash of a slightly greenish tint to kill it, and make it a good black. Prussian blue is greenish, and it and ivory black make a green black. Every colour has its complementary or colour of greatest contrast. Thus the complementary of yellow is purple; of red, green; and so on. Every colour has a tendency to force, as it were, its complementary out of every tint near it. Observe a yellow gravel walk in sunshine, and it will be seen how purple the shadows are; but if the walk were *all* in shadow it would not look purple, because the complementary would be wanting. It is of great use to remember this in painting. For instance: if you have to paint a man with an abnormally red face, were you to put something green near it on the picture—say a curtain—you would make him look redder than ever; but put crimson or red near him and you may put all the colour of nature into him as near as paint will go, and he will not look unpleasantly red.

Joseph Wake.

AN IMPROVEMENT IN THE CAMERA FRONT.

[A communication to the Manchester Photographic Society.]

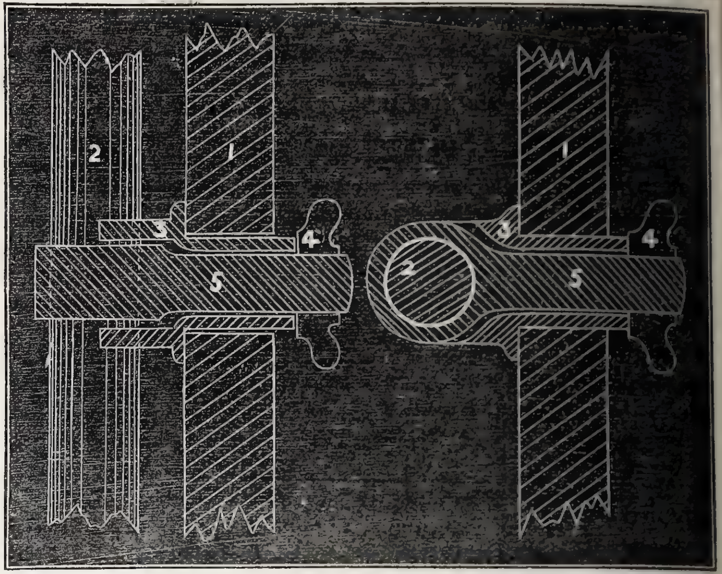
I beg to submit for the examination of the members of this Society a substitute for the usual slit in the camera front fitted to my rectangular camera, and giving any amount of motion, limited only by the inside of the camera itself. It is perfectly light-tight, very simple, and, although it looks a formidable affair on paper, it is applicable to any size of camera, however large.

The utility of the ball-and-socket mount was checked by the old slit, so there was nothing left but to contrive something better. Now all is clear, and no one need be bothered with the old state of things any more.

The accompanying sketch will, I hope, give an idea of the arrangement. The left-hand drawing is an elevation, the right-hand one being a plan.

1 represents part of the sliding front.

2 is a round iron rod fixed inside the camera near to the inside face of the sliding front, down towards the bottom and under the lens or up towards the top of the inside, either way. The sliding front has a hole cut through it by a centre bit, midway from each end; this is to allow a brass ferrule 3 to pass through to carry the front. This ferrule is continued on towards the rod 2. Through the ferrule a small wrought-iron eye bolt 5 passes, the left-hand end having an eye through which the round rod 2 moves easily; the right-hand end is screwed and furnished with a milled-headed nut 4.



When the nut 4 is screwed up tight it presses against the end of the ferrule as an abutment, drawing up the eye bolt, and with it the rod, against the left-hand end of the ferrule; and so, between the two the rod is gripped fast, and the front supported by the ferrule, without there being any strain upon it.

In the camera exhibited the rod 2 is eight and three-eighths inches long by one-sixth of an inch diameter, its weight being 329 grains.

The eye bolt, ferrule, and nut weigh only 183 grains; the whole apparatus having a (very) gross weight of 512 grains, or just thirty-two grains more than an apothecary's ounce.

M. Noton.

NOTES FROM AMERICA.

The State of Photographic Business in the United States.

In reply to queries put by him, the editor of the *Philadelphia Photographer* has secured a great amount of useful information concerning the present state of the art, the prices, &c., prevailing in various parts of the United States of America. From this interesting compilation of facts, which relates mainly to portrait photography, we shall give a few extracts in the belief that our readers in this country will be much pleased at being apprised of what is going on among their brethren on the other side of the Atlantic.

From Boston, Mr. E. L. Allen, speaking at first for himself, says:—

> I will here say, mainly for the benefit of the younger members of the craft who may chance to read these lines, that I have always made it a point to deal square. Never to tell wrong stories, and always so far as in my power to give people an equivalent for their money. This word of advice I consider the more necessary, as you all know we have one of the most elegant chances in the world to swindle people if so disposed. A photographer's patrons are largely at his mercy. For instance, a customer may come in and inquire as to the durability of the specimens he finds on your walls. I have known the reply to be instant and all assuring—"O, those are permanent; they are finished in crayon," when the facts were, the prints were solars, and the most perishable of anything that can be made in our line, and all the finishing in creation would not prevent them from fading. That I know to be practised up to the present time, and it is a blot upon our fair fame. Any close student of the photographic art, or any one with only a bread-and-butter interest in the business, cannot but be more than pleased with the progress that has been made in the last few years. Indeed it is truly astonishing. Go where one may, even to the most remote corners of the country, and we will find good and sometimes most excellent work made, and to my knowledge better pictures are being made today by some country than by some city photographers; and this more particularly in the comparatively new branch of carbon work. And now that I have to speak of carbon, I almost tremble with the feeling that I am treading on dangerous ground, for have I not read some of the articles that have been published on that subject? But I cannot tell you much about our business without speaking of it, so for that reason I must be excused. We

are using the carbon process today successfully. We make nothing larger than cabinet card in silver. We do not consider it of so much importance for small pictures, because people sit often for those; but for everything designed to hang on the wall—all copies that require to be finished—everything from 4-4 to life size are printed in carbon and finished by the best artists that we can command. We use the single transfer for our enlargements, which is very simple, and when it becomes known will be of very great advantage to the operator. At present it does not seem to be generally understood. Our prices are the highest that we can charge for the present quality of our work. When we can make better work we can charge higher prices. Prices have steadily advanced since the great war rush. We now charge six dollars per dozen for cards that we made then for three dollars, and at the latter price we made money; now we can make no money on cards. Then we knew nothing about finishing negatives or burnishing; now those operations consume a great deal of time. Then one sitting as a general thing sufficed; now it is the exception when a sitter orders from the first set of negatives. The rule is to sit twice, and often three times, not because we have not made good pictures; they acknowledge they like them, but want to try again, just to see if they cannot get something better. Even babies are brought to sit over again, on account of expression, so fastidious have our customers become. We use three glasses on a sitter, as a rule, making two impressions on a glass for cards, and the same size glass for cabinets making one impression. We have no trouble in getting our prices; our only trouble is how to increase the cost of our work—that is, make it worth more money. We consider our success to depend entirely upon maintaining high prices, and never losing sight of the main point, viz., to make the best work we know how. As to how much the public taste has improved it is hard to say; but that it has improved there is no doubt. When a sitter comes with two or three sets of proofs, and tells you he wants to sit again, but don't know why, and finally order from the first set, you begin to doubt any cultivated taste, or even common sense, in the subject, and yet it happens every day. On the other hand, and to offset that, we must look at the other side, and I would not be doing justice to a large number, and by far the better part of our patrons, did I omit in this article to bear testimony to the many flattering compliments bestowed upon us by the most cultivated and appreciative people of this city. Our great point now is permanency. For nearly thirty years we have been making pictures that have lasted indifferently well—some longer, and some shorter, but a large majority of which are faded and gone. In the face of these facts we cannot expect the public to be very enthusiastic, or even take our word at par for anything new we may have to offer them, considering the amount of lies that have been told them. Consequently we must expect to peg away for some time to come to eradicate the present impressions on the public mind, and substitute something better. Business thus far this year has been good, considering the extreme general depression, and we look for increased improvement in the autumn. For styles we confine ourselves strictly to plain portraiture, and attempt little in the fancy line. This, I think, is induced more by the tastes of our customers than of our own choice. Accessories are very well when rightly used, but in unskilful hands are better ommitted. We cannot all be Saronys or Notmans, neither are the tastes alike in different communities, therefore we must be governed largely by circumstances and the demands of those who seek our services. Herein lies the secret of success in our business (and in every other for that matter)—to combine all the advantages that a quick eye and active brain can discover with the greatest possible amount of amiability of which human nature is capable. I mentioned in the early part of this article that I was now largely devoted to looking after the money part of the business; that is, getting paid for what we do. By so doing we have been enabled thus far to pay 100 cents on $1. My experience is that this long-suffering public whom we have so fearfully abused would have no hesitation in getting even with us, by walking off with any amount of goods if we would let them; therefore, we demand payment of all small sums at the counter, unless it is somebody that we very well know, and it is because we do know some very well that we make this little demand. Of course we have names on our books that we would be only too glad to charge any amount. We make our bills monthly, and have little trouble in collecting. It is a part of our religion—indeed the first article of our creed—to pay our bills; and we consider it a charity both to ourselves and our customers to make them do likewise. A man owing a bill in one place is very apt to go elsewhere for an article in that line if he happens to be a little short, so we think that pay as you go is the best practice for all concerned.

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REMARKS ON THE DIFFERENT DEGREES OF SENSITIVENESS TO LIGHT OF THE BICHROMATE SALTS.

It is not altogether a matter of indifference which of the double compounds of chromic acid with oxygen and a base is used as a sensitising medium, since their susceptibility to decomposition by light differs greatly, and consequently so does their sensitiveness to light. The ease with which they are crystallised and the difficulty of dissolving them are greatly detrimental to their sensitiveness to light, which depends upon—

1. The quantity of the ingredients required in the preparation of the salt.
2. The equivalent of the metallic oxide combined with the chromic acid.
3. The stability of the compound formed by the acid with a metallic oxide.
4. The ease with which the monochromate salt of a metallic oxide can be decomposed. This property is, however, peculiar to the ammoniac salts.

The greatness of the quantity of a salt which can enter into a preparation depends upon its solubility in water, as when very soluble a salt is not so quickly formed by drying in prepared crystals. In this quality the bichromate salt of potassium is considerably surpassed by the bichromate salts of ammonium, lithium, sodium, and calcium.

The two last-named double salts are so deliquescent that they can be added to organic matter in almost unlimited and increasing quantities. They also furnish preparations very sensitive to light; but their deliquescence is a great hindrance to their manufacture and to their being largely used in commerce. The lithium salt is also excluded from practical use on account of its high price; it is the same with the double salts of the oxides of the earthy metals, as their solutions act on organic matter almost like free chromic acid, and are decomposed in its presence without exposure to light, the second equivalent of the chromic acid being too feebly combined with the base.

There remains, therefore, only the ammonium salt, which is very soluble in water, and, like the potassium, is sold in beautiful large crystals.

The second condition required to produce great sensitiveness to light is a small equivalent of the metallic oxide. The smaller the number of equivalents of the base the greater the proportion of chromic acid present in equal quantities of the prepared salt, and, therefore, the greater its sensitiveness to light.

On computing the proportions of chromic acid present in the double salts they will be found to correspond to the following scale:—

100 parts of bichromate of potassium contain 68·2 parts of chromic acid, and 31·8 of the metallic oxide.

100 parts of sodic salt contain 76·4367 parts of chromic acid, and 23·5633 of the metallic oxide.

100 parts of bichromate of lithium contain 94·356 of chromic acid, and 5·644 of the oxide of the metal.

100 parts of the calcium salt contain 78·22 parts of chromic acid, and 21·78 of the basic oxide.

100 parts of the ammoniac salt contain 79·46 parts of chromic acid, and 20·54 of the basic oxide.

According to these figures the lithium salt contains the largest, and the potassic salt the smallest, percentage of chromic acid.

The sodic, potassic, and ammoniac salts vary but little from each other, and, on the grounds already stated, the ammoniac seems the most suitable of these three salts for use as a sensitising compound.

The third requirement for the production of sensitiveness—namely, the degree of cohesion between the chromic acid and the metallic oxide—is also most favourable in the ammoniac salt.

The monochromate salts of potassium, sodium, and lithium have an alkaline reaction, and the bases of their compounds seize the second equivalent of chromic acid in the double salt better than the ammonoxide, and are not so easily and quickly decomposed as the latter by the action of the light.

Lastly: ammonoxide is distinguished from other bases by the rare property of being so sensitive to light in its monochromic compound with chromic acid as in its double compound with that acid. If any chromic double salt be neutralised with caustic ammonia the latter evaporates from the compound after drying, leaving the original double salt. The sensitiveness of the preparation is thus not impaired in the slightest degree by this addition.

Bichromate of ammonium, when neutralised to the single salt with caustic ammonia, owing to the partial evaporation of the caustic ammonia, returns again, after being dried, to the double salt, which in presence of organic matter is decomposed by light, leaving *a monochromate salt* and a chromium peroxide. *The monochromic salt of ammonium, however, gives up by evaporation a further part of its caustic ammonia and is again changed into a double salt, which is in turn decomposed by the continued action of the light, and this process is repeated as long as there is any chromic acid remaining in the compound.* This process, which actually goes on when preparations furnished with chromated ammonium salts are exposed to the light, is the cause of the extreme sensibility of these salts to the action of light, which exceeds that of the potassic salts by three times. The high price of chromate of ammonia, however, prevents its use becoming so general in the various printing processes as its usefulness would make desirable.

—*Photographische Monatsblätter.* J. Husnik, *Prof.*

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PHOTOGRAPHY AT THE PREFECTURE DE POLICE, AT PARIS.

It is some time since photography has been made use of in the interests of the police and justice. The rapidity of the processes and the rigorous exactness of the results which the art furnishes render it too valuable an aid to be neglected. For some time, however, it was any photographer, more or less skilled, to whom was left the execution of this judicial work; but the numberless inconveniences of this plan of proceeding caused the camera, after a while, to be used only in the most urgent cases, notwithstanding the great advantages which proceed from its employment.

In 1854 M. Moreau Christophe, then director of the central establishment at Eusisheim, made the proposition that all the prisoners should be photographed immediately prior to their discharge. To the portrait was annexed an account of the individual, biographical notes, and some extracts of the proceedings taken against him. The importance of making a collection of this description may well be imagined; but, nevertheless, no decision was come to in the matter, and it remained in the form of a proposition.

In 1871, at the time of reorganisation which followed the disasters of France at the close of the Franco-German war, a man of considerable energy, who had earned the right of making himself heard (M. Lombard, a peace officer), obtained from one of the *prefets*, whose spirit of progression was well known, the necessary authority to form a small photographic service, to be employed upon the most urgent business connected with the police.

A very modest equipment and store of materials were acquired, and the charge of these given over to two police officers, who were detached from their ordinary work for the purpose. A suitable *locale* was secured in a disused police station, and the same properly fitted up. It was not long before the value of this improvement began to testify itself. M. Voisin, who succeeded M. Leon Renault as *prefet*, did not show himself less interested in the success of the new department, and by degrees the staff confided to the care of M. Lombard was augmented, and the establishment soon acquired significant proportions. Work was not wanting for it to do.

At the present moment the photographic establishment of the Paris police includes eight operators, or special *employés;* it is complete in every way, except that the staff and *matériel* at disposal are still somewhat insufficient, seeing the multiplicity of the work to be performed and the urgency that frequently marks the operations to be carried out. As to the *locale*, it consists of several apartments in various parts of the building.

There is, first of all, a studio where portraits are taken, in a garret near the *Palais de Justice*, and another in connection with the Morgue; the latter studio is on a terrace upon one of the houses of the quay. At the prefecture itself, in the quarters of M. Lombard, is to be found an apartment where paper is sensitised, printing conducted, and the pictures retouched and mounted; and, finally, a cabinet near at hand contains all the negatives properly classed and put away in big cupboards. These are the archives.

The work going on is incessant, and is executed with an order and precision which nothing seems to disturb. Every evening the Director of the House of Detention sends in the list of individuals who have been remitted to his charge during the day, and whose arrest is provisionally decided upon. M. Lombard extracts from this list the names of all who are known to be bad characters, who are designated assassins, thieves of various character, escaped convicts, and so on. In each case he fills up a form, which serves the prisoner as an entrance permit to enable him to visit the portrait studio. All these forms are sent to the photographic establishment, and the work of the latter is arranged for the morrow.

At an early hour in the morning the work begins, the prisoners filing in according as their names appear on the list. Each prisoner corresponding to the form previously filled in is taken from the House of Detention behind Sainte Chapelle, and, escorted by policemen, he crosses the courtyard, and after numerous detours ascends the stairs which lead to the studio. Arrived at the studio, the policeman in charge of the criminal delivers the form in which the man is identified, and all being in order the escort receives a receipt for the prisoner. In less than half a minute two portraits are taken of the model—one full face and the other profile—and the sitter is then passed on, and another taken in hand.

The process of photographing is a very summary one. The studio has not twenty superficial metres; the roof, very much inclined, is replaced at one side by a glazed frame, which permits a very bright light to pass, striking the model very closely. Two operators—one placed in an alcove screened by a dark curtain preparing the plates, and the other in a recess to develope and fix the negatives—work on uninterruptedly, while a third photographer poses the prisoner and takes two portraits of him. There is always a plate ready and the lens is always focussed, so that not an instant is lost. The average number of double negatives taken in this studio is from thirty to thirty-five daily.

When the day's work is done the printed forms are collected, and they are arranged in alphabetical order in long boxes, where they remain until impressions from the negatives have been secured, so that no mistake or oversight can occur. It may be easily guessed of what value are these records, thus taken daily, from a judicial point of view, and as regards public safety. But the functions of the police photographic department do not end here. As soon as a murder is discovered, and the remains of the victim have been transported to the Morgue, a photograph is taken of the murdered man or woman; further photographs are secured of the scene of the murder by the police photographers, in case such representations may hereafter be required in the courts of law for submission to the jury. The acts of conviction are in like manner photographed. Bodies at the Morgue which fail to be recognised by friends or acquaintances are also photographed before they are buried, and these anonymous and posthumous portraits, added to the registry of the lugubrious establishment, place it in the power of the family or absent friends, on presenting themselves afterwards, to recognise a lost friend or relation.

Notwithstanding the disadvantages under which the little staff labours—the surfeit of work, the inconveniences of the improvised apartments, and the unfavourable conditions under which the greater part of the operations are conducted—the results obtained by this new branch of the police force are exceedingly satisfactory, while many of the portraits would do honour to the most skilful photographer. Some views recently taken of scenes made notorious by criminals—those notably of Godefroy's house at Neuilly, of the building in the Rue de Boulogne, the Ducourtieux Pavilion, &c., which measure not less than forty by thirty centimetres—are pictures of a first-class order. In the case of interiors the objects are so dark that recourse is necessary to magnesium light and other artificial illumination; but, despite these attendant difficulties, the police photographers always manage to secure satisfactory results.—*Le Petit Moniteur*, per *Phot. Times.*

ON THINGS IN GENERAL.

I HAVE been very much interested in reading in the columns of THE BRITISH JOURNAL OF PHOTOGRAPHY the articles on colouring photographs by Mr. Joseph Wake, evidently the work of a practised hand who knows what he is writing about, which is much more than I can say of many who write for the edification of photographers. Mr. Wake, in his first chapter, says:—"It is very essential to give the eye a lifelike, thinking expression, and if this be done it will hide a multitude of sins in other parts of the picture." Now this reads very nicely—"a lifelike, thinking expression"—but, "there's the rub!" how is it to be done? What is the process? Again, too, I think there is a little too much gum in his instructions. For example:—"This first wash is, I think, better without gum, because it represents the lights of the face, and by keeping it dull and the shadows transparent and gummy," &c. It is not good art to get transparency by gum, though a good deal of labour may be saved, which for the learners he writes for is a point of importance. I must take leave of him by saying that his advice in No. II., with regard to alteration of his model, might be studied with advantage by a vast number of retouchers, to whom it is equally applicable:—"Fill in all the little uneven patches and holes, strictly preserving, however, the lights and shades and markings of the muscles. The object is not to fill up all depressions and wrinkles." There is the whole thing in a nutshell. I once heard a photographer of artistic feeling give one of his retouchers a lesson in a droll fashion:—"You remind me," said he, "of the Irishman's advice to his son upon joining in a free fight, 'wherever you see a head hit it,' and that," he continued, "is what you've done; wherever you've seen a line or a spot of unusual transparency you have hit at it, and smoothed it out with your pencil, regardless of what it meant. Never make a stroke without a reason, and never without being sure it will improve the likeness."

Mr. Witcomb's letter on carbon printing and its freedom from difficulties—happy man! he positively finds no difficulties—will be read with much interest, and he deserves our thanks for communicating so freely from his stores of experience. I am afraid few others will be able to bear him out in the matter of freedom from troubles; but all will appreciate the value of his hints—except, indeed, that class of people I have before alluded to, who know nothing of the matters they write about. I am credibly informed that one weighty authority, in commenting on Mr. Witcomb's instructions, considers that no question will arise upon his recommendation to allow the print to remain a little longer soaking in cold water than is usual before commencing development with hot water. That this commends itself to the judgment will be accepted without dispute. This is rich beyond measure! Will it be believed that the groundwork of this will be found in Mr. Witcomb's words as follows?"—"When developing, and as soon as the paper has peeled off from the pigmented gelatine beneath, allow the plate to rest in *the water* for at least two minutes." Picture to yourselves, my readers, the preliminary peeling and subsequent development of a print with *cold* water! There are so many germs of novelty in this that it should be patented, like Captain A. J. Russell's idea, which, I learn from the proprietors of *Anthony's Bulletin*, has been patented. It is the first time in my knowledge of an idea being patented and presented to the public. But a decided change has come over the face of things of late.

Not long ago there was a detailed and evidently verbatim account going the rounds of photographic literature of M. Klary's system of lighting. If this be not on someone's part a breach of confidence I should like to know how it came about that information which is charged a hundred francs for can be obtained as well by buying a pamphlet or a copy of a photographic periodical for a few coppers. If this sort of thing were to become a little more common, process-mongering would receive its deathblow, and I think there would be no one to regret it but the mongers themselves. As, however, they are not extinct, I convey to them gratis an idea I saw as nothing of any moment, so far, has been done in exploiting developers.

I read the other day that a silvery scum arising in development is silver reduced to metallic form by some reducing agent present. As it is evident that the writer must be acquainted with a developer that does not contain a reducing agent, nothing would be required but the secret to be purchased and the wonderful compound would meet with an extraordinary success. Happy will be the *exploiteur* who can manage to secure it! Possibly it may be found to be connected, by some link at present unknown, with a developer of M. Flament's, who, in *Le Moniteur*, according to an extract from its pages by the same hand, states that "developers redden a short time after preparation, and when in contact with the air become charged with acetic acid to the detriment of their reducing action. To prevent this inconvenience, and in order still to be able to make use of the bath, which, in this condition, acts rather slowly, I deem it well not to add the acetic acid and alcohol till I make use of the solution." How acetic acid can change its action in so wonderfully short a time is a mystery to me; but, as I have just said, a change has come over the face of things lately. FREE LANCE.

Meetings of Societies.

MANCHESTER PHOTOGRAPHIC SOCIETY.

THE first meeting after the summer recess was held at the Memorial Hall, on Thursday evening, the 13th inst.,—the President, Mr. Alfred Brothers, F.R.A.S., in the chair.

In the absence of the books, through misadventure, the confirmation of the minutes was postponed until the next meeting.

Mr. Coote exhibited a number of fine collodio-albumen negatives taken during his summer trip to Connemara.

Mr. M. Noton showed and described a new method of arranging the camera front. [See page 462.]

Mr. Lund exhibited a collodio-albumen plate, prepared by Mr. Pollitt in 1869. This plate was exposed by Mr. Lund about September last year, and developed on the 12th inst. The result was a good, clean negative.

As is usual, the first meeting of the session was thinly attended, and the members present busied themselves with the Society's portfolio.

After a vote of thanks had been accorded to Messrs. Coote, Noton, and Lund the meeting was adjourned.

EDINBURGH PHOTOGRAPHIC SOCIETY.

AN outdoor meeting of this Society was held on Thursday, the 20th inst., the scene of operations being Largo—one of the numerous quaint fishing villages on the east coast of Fife, famous from its connection with the popular song "The Boatie Rows," as well as being the birthplace of the celebrated original character (Alexander Selkirk) in De Foe's ever fresh romance, "Robinson Crusoe." Largo stands at the head of the bay, and affords, both in the harbour with its fishing boats and in its straggling and often picturesque houses, some capital work for the camera, while within easy distances are several ruined towers or castles, and an interesting Runic monument well worthy of being visited.

In consequence, not so much of its distance from Edinbugh, as of the out-of-the-way corner in which it lies, added to the necessity for crossing the Firth of Forth and the limited train service, an early start was necessary, and so the party left the Waverley Station at 6·25 and reached Largo at 8·30, quite ready for a good breakfast, although, as it turned out, the latter was not ready for them. As the worthy Treasurer was the only member who had not brought his camera, he was dispatched on commissiarat duties, while the rest went on exploring expeditions. As the morning was fine, the light all that could be desired, and there was hardly a trace of wind, the party were sanguine of a successful day.

> "But, ah! how little mortals know,
> When chance may prove their friend or foe."

Largo contains two inns—the "Railway" and the "Crusoe"—and the commissary, believing that it is true of hotels as of men, that a good deal can be learned from external appearances, resolved to reconnoitre a little before deciding as to which he should patronise. There was, however, not much to choose between them, except perhaps that the windows of the one were cleaner than those of the other; and, having a leaning to the ancient rather than the modern, he applied to the "Crusoe," but applied in vain. Like its prototype, it would have gladly taken in one, but on no consideration would it undertake to breakfast the party. Well, of course, there was no help but to try the "Railway;" surely he would succeed there. It's very name implied progress, and hinted at preparation for travellers; but, alas! his application there seemed at first doomed to share the fate of that made to the "Crusoe." The good wife of the "Railway" thought she could manage one, or perhaps two, but there really was nothing in the house to breakfast so many as he wanted to cater for. Fish, the commissary suggested; surely Largo bay had still plenty of fish. But no! the fishermen had either not cast their nets, or, if they had, they had not caught even the classic "nine," as there were only three available, and what would they be amongst so many? However, after considerable persuasion, the landlady agreed to do the best she could, stipulating that they must be satisfied with the three fish and as many eggs as they could eat, and, as "hunger is good sauce," they enjoyed the breakfast thoroughly.

By the time the matutinal meal was finished the clouds had gathered in, obscuring the sun and casting a gloom over the hitherto cheerful prospects of the day, the sky having assumed that dull, leaden appearance which usually betokens a continuation of the same. They proceeded to the harbour, however, and several plates were exposed there by the younger members; but the older and more experienced—and perhaps, too, less enthusiastic—decided to give it up as a bad job, and return to Edinburgh by the first train, considering the flat, uninteresting pictures to be got in such a light not worth the trouble of taking. But by the time Burntisland was reached an unexpected change had taken place, and the sun again put in an appearance. Here they remained and exposed a number of plates—some on the shipping in the docks, and some in the not unpicturesque streets.

By five o'clock the plates were exhausted, and the party adjourned for refreshments; after which Mr. Pringle took the chair, and some routine business was transacted. Mr. Lawson was admitted an ordinary member.

The plates included the ordinary collodio-bromide, and gelatine as modified by Mr. Gray, the exposures varying from ten seconds to thirty minutes. The former time proved quite long enough for the gelatine.

Correspondence.

GELATINO-BROMIDE.

To the EDITORS.

GENTLEMEN,—I think Messrs. Wratten and Wainwright rather exaggerate the difficulty of making gelatine emulsions in hot weather. They suppose me to be making an emulsion in July, and, really from their description of my supposed proceedings, one might think it a difficult piece of work indeed. Well, it so happens that some of the finest gelatine emulsions I have made were made in July last year. There is no difficulty. I poured out to set at night (and in a small plate, too, so that there was a good thickness of gelatine), and it was always quite firm in the morning. I have never used ice in any part of the process.

Of course it would not do to make only one ounce at a time for commercial purposes, yet it is enough for an amateur, who only wants a few plates occasionally.

It would be interesting to hear what these gentlemen can say about the addition of organic matter to gelatine emulsions, and to know something about the experiments which have led them to the conclusion that all such additions are not only useless but hurtful.—I am, yours, &c., G. MORTON.

Ipswich, September 22, 1877.

THE CHROMOTYPE.

To the EDITORS.

GENTLEMEN,—Having lately taken out a chromotype license in exchange for our autotype one, we are in a position to give Mr. Urie *one* very good reason why the company charge, and we agree to pay (which is more to the purpose), thirty pounds for it as against five pounds for the autotype. Our reason is in a nutshell; the company allow to "thirty-pounders" a preferential discount of ten per cent. on all tissue and materials, and it answers our purpose to become chromotype licensees on that account solely.

We do not understand Mr. Urie's argument as to the infringement of Johnson's patent by Lambert, as we always understood that Lambert obtained special permission from the Autotype Company to use Johnson's patents, and we believe the right to use them was granted to every licensee of Lambert's.—We are, yours, &c.,

September 26, 1877. SHARP BROTHERS AND CO.

MOUNTING PHOTOGRAPHS IN ORDINARY ALBUMS.

To the EDITORS.

GENTLEMEN,—In last week's Journal "C. P." desired to be informed if there be any method of improving the look of prints that are mounted in an ordinary scrap album. I fear I cannot make any suggestion for the improvement of those that *are* mounted; but should "C. P." have any more to mount I would advise him to try the plan I adopt, and for which I am indebted to a writer in your ALMANAC.

On an ordinary drawing-board (I use the glass of a large show-card) stretch a sheet of cartridge paper, and, while damp, paste your untrimmed prints thereon, taking care to avoid air-bells. After standing over night to dry, cut out your prints and trim them. Then to put them in the scrap album put round the edges about the eighth of an inch of thin glue, which will cause the stretched print to adhere in a few seconds. Treated in this way my prints have much the appearance of having been rolled, and no puckering.

But, perhaps, I am giving all the credit to the way in which they are mounted. The paper you use has a good deal to do with it. I use Rouch's sensitised paper, and get fine warm tones and glossiness. For mounting I use American silver glass starch; it is superior to all other starches for that purpose.—I am, yours, &c., J. C.

Edinburgh, September 22, 1877.

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THE PHOTOGRAPHIC EXHIBITION.

To the Editors.

Gentlemen,—Will you allow me to call the attention of your readers to the fact that the last day for receiving pictures for the forthcoming Photographic Exhibition is Tuesday next, the 2nd October?

Intending exhibitors are particularly requested to comply with the published regulations, as any breach of them may lead to the non-acceptance of their pictures.—I am, yours, &c.,

5, *Pall Mall East*, H. Baden Pritchard, *Hon. Sec.*

September 25, 1877.

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CHROMOTYPE CARBON PRINTING.

To the Editors.

Gentlemen,—Mr. J. R. Sawyer seems to have taken very much to heart my small jokes about the "raps over the knuckles," and to have come down upon one with more than forty autotype power, with a view of showing that I do not know very much about the subject of chromotype printing. Well, I hope that worthy gentleman will be quite assured that my remark was only a little bit of fun; that, spite of differences of opinion, we are and shall, I trust, remain very good friends. When at Ealing nothing could exceed the courtesy with which I was treated, and nothing has occurred since, that I know of, to interrupt the good understanding then begun.

But, with reference to the two points I named, Mr. Sawyer seems to forget that his experience and mine may be quite different. Perhaps all the clever folks that come to him know quite well that the picture should remain some time to soak and soften in the warm water before developing; but I can assure him that the majority of the people who come to me know nothing of the sort. They strip off the paper and slap on the hot water full force. I know of no better way of destroying the half-tone and softness of a chromotype print than that, and I have seen it done dozens of times; so I do not think I was far wrong in putting in a special caution about that.

Then about the strength of the bath: whatever the *Autotype Manual* may say I am under the impression that the company recommend a bath of three or three and a-half per cent. Now, I constantly use a bath of not less than five per cent., and I maintain, and think I can prove, that a bath of that strength will give a softer and a better print than a weaker bath. I daresay the strength of the negative may have something to do with it; for my negatives, however, I am quite certain that the stronger bath is the better one.

Mr. Sawyer's suggestion for sensitising a large quantity of tissue at a time may be all very well, but I think it is better suited to a large business than to that usually found among country photographers; however, I am quite willing to learn. But, even if it be proved to be a good plan, it is extremely probable that for persons situated as I am the sensitising over-night for the next day's consumption is the best and most convenient method to adopt.

I do not think I have "slain all the difficulties," but I do think that, having begun at the very beginning, I have had a very good practical experience of most of the difficulties likely to beset ordinary photographers, and, on the whole, am more likely to be able to appreciate them than even the gentlemen of the Autotype Company. As the best way to combat a difficulty is to know exactly what it is, I venture to think that the hard fight I have had has left me an experience that is not without its value.—I am, yours, &c., C. J. Witcomb.

Salisbury, September 25, 1877.

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SPECIFIC GRAVITY OF ALCOHOL.

To the Editors.

Gentlemen,—We were gratified to learn from the communication of your correspondent, Dr. J. Nicol, published in your issue of Friday last, that he is in unison with us on the principle (which we advocate) of treating gelatino-bromide emulsions.

We have read his remarks relative to spirit of wine and methylated spirit with attention; indeed, we have been so far interested as to test the s. g. of commercial samples in our possession, with a view, if possible, to corroborate or disprove his figures. The subjects of test were commercial spirit of wine, methylated spirit (ordinary), and a quality termed "alcohol methylated, s. g. ·805." For the sake of brevity we will designate these respectively as No. 1, No. 2, and No. 3.

Employing an assay balance sensitive to less than one-twentieth of a grain, and the s. g. bottle, our results were for No. 1, s. g. ·826; No. 2, s. g. ·817; No. 3, s. g. ·809. As to the relative value of Nos. 2 and 3 we need not speak; it will be obvious. No. 2 will do for gelatino-bromide precipitation; and No. 3 will be found equal to the best alcohol for collodion emulsion.

Inasmuch as we believe Dr. Nicol to be an ardent advocate for truth—one who would ruthlessly overhaul his own *data* upon the slightest suspicion of inaccuracy—we have the less hesitation in directing his attention to the figures above given, which are as accurate as a good instrument and extreme care can determine. Alcohol methylated, s. g. ·805 (reputed), is sold openly in the London market, as the enclosed "prices current" of an eminent wholesale firm will testify.

As to that methylated alcohol, s. g. ·796, which Dr. Nicol "knows to be obtainable," we frankly yield the palm of superior knowledge to him. We had not heard of it before. Those who esteem honesty before "smartness" in business will never run counter to excise regulations.—We are, yours, &c., Wratten and Wainwright.

September 25, 1877.

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THE AUTOTYPE PATENTS.

To the Editors.

Gentlemen,—In making this brief reply to Mr. Urie we emphatically decline to be dragged into any controversy *re* the autotype patents. Mr. Urie talks about our "assumed right" to them. Now, there is no question of *assumed* right at all. We bought them, paid for them, have kept them up, have granted licenses under them, and until they lapse either by efflux of time or in consequence of some adverse judicial decision, our right to them is absolute.

Mr. Urie seems to know nothing about the matter of which he is writing. He says that the company acknowledge that the principal Lambert patent "is an infringement on Johnson's double transfer process." The company never has acknowledged anything of the sort, and *could* not do so, for the very good reason that Lambert nowhere claims any carbon printing process of any sort, either single or double transfer. A reference to his patents No. 1643, A.D. 1874, No. 3633, A.D. 1874, and No. 1825, A.D. 1875 will fully prove the correctness of this assertion.

When M. Lambert took out his patents and proposed to apply his improvements to carbon printing, he came to England and did what a shrewd business man naturally would—he applied to us for leave to work under *our* patents. A treaty was made satisfactory to both sides, by which M. Lambert's licensees were formally entitled to the use of all the autotype patents (with certain reservations) under specified conditions. Then, about the patent for tissue making: had the Glasgow Photographic Association been aware of the facts about "Swan's patent" they might have saved themselves some expenditure, a good deal of trouble, and some rebuffs; for, whatever the success may have been, we know a good deal to the contrary side of the account.

It never seems to have struck the Glasgow society that a patent can only be renewed by the patentee declaring that he has been insufficiently reimbursed for the time and labour expended about his invention. It was impossible for Mr. Swan to make this declaration, inasmuch as he had disposed of his patent years ago to the then Autotype Company for a good and sufficient sum of money, and the society really put themselves in motion to get up an opposition to what could never take place. The profession will quite understand to what extent they stand indebted to the Glasgow society.

No doubt the impetus to produce the "best material only" will be very strong when the patent expires; but, seeing that at the present moment we export to France, Germany, Austria, Italy, Norway, Sweden, and Denmark more than half the tissue we make—that our material has to bear all the expenses of freight, all the difficulties and delays of transit and custom-house—and still can compete with foreign manufacturers, we are disposed to regard with some equanimity the arrival of that happy time when Mr. Urie will throw up his hat and proclaim "*delenda est autotype*," for the tissue trade is no longer a monopoly.

Mr. Urie knows singularly little about carbon printing of any sort to judge by his letter. He cannot have read your articles on single transfer and not know that the "workable system" of single transfer has been discovered long ago. We can imagine he would *not* read the *Autotype Manual;* but why he should ignore the teachings of such Nestors in the art as yourselves, or why he should decline to sit at the feet of the Gamaliels of The British Journal of Photography, is to us a little puzzling. However, when the "monopoly" that seems to put his "back up" so terribly is extinct, he may take more kindly to his "larning," and make himself a wee bit acquainted with the matters upon which he wishes to treat.

Introducing, as we have done, an entirely new branch of business to the profession, we are glad to see our compeers doing good and successful work. We have been the pioneers in the enterprise of permanent photography, and have by our efforts added to the money value of many hundreds of photographic businesses throughout the country. Fortunately, the efforts to upset our patents and destroy our position have not been successful, and we can afford to smile at the expressions of ill-will that we (but very rarely) meet with.

We shall now take leave of Mr. Urie. He will know quite well what we mean about our patents. We reserve to ourselves full right to sell them, to give them, or to dispose of them at our own simple will and pleasure; and he will please to remember that it is entirely at the option of any person to take them or to leave them as may suit him best.—We are, yours, &c., The Autotype Company.

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OBSTRUCTIONIST POLICY.

To the Editors.

Gentlemen,—It is no doubt within the experience of the devotees of the camera that the tripod is almost an invariable passport to all that is interesting or beautiful throughout the length and breadth of the land, and they are grateful to the fortunate possessers of the picturesque nooks and corners and interesting specimens of architecture, both ancient and modern, for the facilities so freely afforded for the practice of photography. Just in consequence of the fact that such liberality is almost universal, they look with surprise on anything like an exception to the rule.

Few tourists—especially if they be photographers—miss visiting the Abbeys of Melrose and Dryburgh, as both furnish excellent food for the camera, and it is rare to find a collection of photographs which does not include several pictures of each. Melrose is generally taken first, and the operator is at once put into a state of good humour and his work facilitated by the kindness and courtesy of the agreeable young ladies who take charge of the visitors there. From Melrose the photographer may go to Dryburgh either by rail to St. Boswell's or driving to the suspension bridge; but in either case he has a good, long walk before him, which, if the day be hot and his traps heavy, brings him into a state in which he has little need for annoyance or disappointment. The entrance to the Abbey grounds is guarded by a closed gate; but the charge of admission is not heavy, one shilling admitting a party of three, although the same sum is charged for a single visitor. A pleasant walk through a shady avenue brings the grand old ruin into view, and fatigue is forgotten in the prospect of obtaining some of the most charmingly-picturesque "bits" that are to be found in any country.

So far all goes well. The delighted photographer makes a rapid survey with a view to determine the most effective points, and then, although perhaps "wearying" for his pipe, puts off that comforting companion till he has commenced his first exposure. Alas! however, for his short-lived delight! "The best-laid schemes o' mice an' men gang aft a-gley," and his is doomed to take the crooked gait. But what will follow had better be told in the words of the correspondent to whom I am indebted for the information. After writing in most laudatory terms of the pleasure of his visit to Melrose, of the kindness of the young ladies who act as *cicerones* there, and of the beauty of Dryburgh and its suitability for photographic work, he says:—

"In such a frame of mind I arrived at gloriously-picturesque Dryburgh, but alas! how short-lived are our musings! Before unlimbering I was judging my distance for making a beginning on the tomb of the immortal Scott, when I was accosted by the keeper of the grounds, and told that before commencing to work *I must make a deposit of ten shillings, which would be returned on his receiving twelve copies of what I had done.* Well this was a closer for me!—an amateur with a few dry plates and no *certainty* of what I might get when I returned to the developing-room! Between exposure and development what accidents might befal the plates!—dangers of transit, prying curiosity of friends, or other causes, and, as I thought of this, I resolved not to deposit. Of course I tried to reason the question with the man, but he assured me that he had no discretionary power in the matter, and that the obnoxious regulation was made by the factor, in consequence, as I understood, of either himself or some of his friends having been disappointed in not receiving some photographs that a photographer who had been working there had promised, but failed to send. It appears that the proprietor of the estate is a mere boy, and that the factor is all powerful, and so I suppose nothing can be done in the matter."

Such is the story told by my correspondent, and I have no doubt that the facts may be relied on; but not so with the inference contained in the last sentence. Factors are amenable to reason, even although they may be all-powerful; and at all events I mean to try, and shall tell my readers all about it by and by. It may be presumed that the fixed charges for admission to the grounds are sufficient to cover the expenses connected with the exhibition of the beautiful ruin, and if they are not, it would surely be more equitable to raise them than to lay a tax on what must be, at best, but a small proportion of the regular visitors, and that, too, made up *largely* of a class who find the cost of their favourite hobby quite heavy enough without the addition of such a partial tax. I am well acquainted with almost every stone in the Abbey, having been a frequent visitor there for many years, and am sure that the great body of tourists will agree with me in saying that the present keeper is a most polite, attentive, obliging, and genial *cicerone;* and he must find it go sadly against the grain to put such a law into force, while his sense of the injustice of it may be understood from the fact that, when my correspondent declined to make the deposit, he insisted on returning to him the shilling paid for admission on the ground that, as he had gone on purpose to photograph, it would be manifestly unjust to retain the money when his purpose could not be carried out.

It will be interesting to find out what becomes of the large number of prints that must be obtained, as there will be many to whom the ten shillings is not so much an object as would be the disappointment of not getting pictures of what they had gone so far to photograph. It is hardly to be supposed that they find their way to the factor, as, being all of one subject, the collection could possess little interest, except perhaps, to show how differently the same thing may be treated by different men; and, therefore, should it really turn out that he is the recipient, it would be an act of charity for the oppressed ones to send prints from negatives of other subjects.

But, seriously speaking, this method of levying "black mail" on the amateur photographer is altogether indefensible. I am neither a chartist nor a communist, and hold in high estimation the rights of private property. I would no more claim a right to enter the private grounds, however beautiful, or photograph the private residence, of a gentleman than I would ring his bell and insist on getting a glass of wine as a refresher during the work of a warm forenoon, although, to their honour be it written, I have pleasant recollections of many a not unwelcome luncheon proffered with commendable liberality under such circumstances. I need hardly say that in those cases I generally sent copies of the negatives then taken, and if any of those kind appreciators of the amateur photographer should chance to see this letter, and who may not have so received the promised copies, he may rest assured that they were not sent merely because they were not worth sending.

While, however, thus, in the fullest sense, respecting the rights of private property, there is a class of possessions that, while private, are so in a totally different sense, and of this class Dryburgh Abbey is a good example. Originally bestowed on some favourite of fortune—sometimes for a good and sufficient reason, but sometimes, also, on more questionable grounds—they have been handed down from generation to generation, each possessor in succession being, or ought to have been, the trustee or custodian for the people—not of our own nation only, but of all nations. Practically this has always been the case, as if both proprietor and people instinctively acted under an unwritten law which declared such hoary piles, so intimately associated with many centuries of a nation's history as to have become landmarks in the history of the world, to be the inalienable heritage of the people so far as freedom to worship at their shrine was concerned.

Property in those landmarks of ancient times as thus defined is quite consistent with the exercise of all due care on the part of the proprietor over that which has thus been committed to him, and with the making of such regulations as may to him seem best for the preservation of the structure, and for the legitimate admission of the people, as well as for the necessary expense connected therewith; but it is certainly intolerable that, while I may look with veneration on the tomb of Scott, I dare not turn my camera on it, or on any other part of the building, in the hope of getting pictures which, if sent to friends across the seas, would cheer them during their years of exile, and send into their hearts happy thoughts of "auld lang syne," until I have paid ten shillings by way of guarantee that I shall by and by enrich somebody with pictures, it may be, worth four times that sum.

Altogether the demand is so preposterous, and so unlike those in authority on the Dryburgh estate, that it must have originated in a misconception, and I am persuaded that the edict will be removed as soon as its effects are properly understood. At all events, as I said before, I shall try, and let you know the result.—I am, yours, &c.,

Edinburgh, September 17, 1877. John Nicol, Ph.D.

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Photography in Court.—At the Southwark County Court, on Monday last, the case of Evans *v.* Marston was heard before Mr. Judge Stonor. The plaintiff, an operator, sued the defendant, a photographer in the Borough, to recover the sum of £8 for salary alleged to be due in lieu of notice. Mr. Grabell, who appeared as solicitor for the plaintiff, said that his client entered the defendant's service in July last, and that after he had been a week in his employment he was summarily dismissed without notice, and he now sought to recover one month's salary in lieu thereof.—The plaintiff said his solicitor's statements were correct. He arranged for £12 a month, but as he was a married man he he was paid on account £2 weekly. He had held good situations in Bath and Bristol, and had referred the defendant to his last employer prior to being engaged by the defendant. In reply to the Judge the plaintiff said no reason was assigned for dismissing him, as he did his duty and was a skilled operator.—The defendant stated that he answered the plaintiff's advertisement in the *Daily Telegraph*, and from his representations was induced to take him for a week on trial. He did not like references, which at the best of times were very unsatisfactory, and preferred a personal trial, and it was always the way he engaged his assistants.—The Judge: "Then you never applied for his references?" The defendant said he did not think it necessary, as testimonials, in his estimation, were merely polite falsehoods. He had only engaged the plaintiff on trial, and if at the end of the week he had suited him he would, as he was pleased with the plaintiff's appearance, have retained him; but, as he was by no means what he represented himself to be, he was glad to get rid of him.—The Judge considered that as the case was one of oath against oath, he must nonsuit the plaintiff, his Honour remarking at the time that he did not quite concur with the defendant's views as to testimonials.—Nonsuit accordingly entered without costs.——At Bow-street, on Wednesday last, Charles Orsich, described as a photographer, of 352, Strand, was summoned before Mr. Vaughan for obtaining money by false pretences. The defendant did not appear. Mr. Abrams, who appeared for the prosecution, said that for a long time past the defendant had been carrying on a system of fraud by advertising in different newspapers, mostly in the *Daily Chronicle* and *Daily Telegraph*, for young women to learn the business and assist in the photographic department. In order to entioe people, and to give the business an air of probability, he had outside his shop a number of photographs of well-known persons—among them that of Mr. Beard, the solicitor, in his dress as Under Sheriff of the city of London—entirely without those persons' consent. In reality no business was carried on there, and the defendant and his wife lived entirely on whatever premiums they could obtain from their victims. There were present in court more than twenty young ladies that had been victimised, and who had paid premiums, amounting altogether to some £160, within the last six months, for situations with the defendant, where they could learn the photographic business. There was every reason to suppose the defendant had absconded. Mr. Vaughan ordered a warrant to be issued on a sworn information drawn up by Mr. Abrams for the apprehension of the defendant.

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ANSWERS TO CORRESPONDENTS.

PHOTOGRAPH REGISTERED—

John R. Prophet, Dundee.—*Portrait of Rev. George Gilfillan.*

☞ *Correspondents should never write on both sides of the paper.*

F. B. N. R.—1. No.—2. He has been dead for over seven years.—3. Chloride of sodium and common culinary salt are synonymous terms.

B. J. F.—Your new tent cannot be registered; the parts and plan of a tent form a subject for a patent, but not for a registration. The design or external configuration may, however, be registered.

TYRO.—Unless the negative were intensified much more than it is at present a thoroughly good print could never be obtained from it, no matter what strength of sensitising bath were employed.

J. MITCHELL inquires if any correspondent will inform him whether or not a wooden photographic studio on wheels is liable to pay rates. The wheels are rather small for the size of the studio, but it moves by their agency when it does move.

HYPO.—The presence of bronze powder, lime, or other deleterious substances of a similar nature will account for the white spots on the print. Bronze powder, however, is the most fertile of all the causes of spots which we have recently had under examination.

OLD SUB.—The black oxide of manganese is never intentionally adulterated with sulphuret of antimony, or "black antimony." We have spoken on this subject to several manufacturing chemists, and all agree that, if present at all, its presence is due to accident, not to intention.

J. S. CLARK.—The albumen is too heavy. Draw the paper rapidly over the surface of a vessel of water so as to remove about half of the coating, and after drying you may then sensitise it with a better hope of success; but it would be preferable to prepare paper specially for the purpose.

ACARUS.—Until we received your letter we were not aware that any person at the present time employed sulphocyanide of ammonium as a fixing agent. We regret you have had to pay so much for your acquisition of this wisdom, but you will soon recuperate now that you are a subscriber to this Journal.

AMATEUR.—To obtain starch in the best condition for the experiment, rasp some potatoes on a grater and squeeze the pulp in a linen cloth. The juice, with the starch, passes through, and after a while the starch will be found as a powder at the bottom. On this try your experiments with iodine and bromine.

REV. S. S. B.—It is probable that you will find the information required in Sir Charles Eastlake's *Materials for a History of Oil Painting*—a work which, if it cannot be obtained from the publishers (Messrs. Longman and Co.) may be consulted at the British Museum, or it may be found in art libraries generally.

B. P. H. (Leeds).—The lens is quite right. Do not part with it for the alleged fault, which, if properly inquired into, will prove to be the fault of yourself rather than that of the instrument. Should you be coming to London soon bring the lens with you, and we shall most willingly bestow a few minutes on an examination of the instrument.

B. C. D.—The act you propose is quite illegal, and if anyone interested considers it worth his while to proceed against you at common law you will be put to very heavy expenses. The negative does not belong to you, and in the eye of the law you will justly be regarded as a thief and a pirate. Besides, apart from morality and legality, it is a *cowardly* act you propose doing.

G. R. JACKSON.—There has been no "cheating" in the matter. You, as a watchmaker, are familiar with Troy weight, by which you buy and sell; but you must remember that nitrate of silver is sold by apothecaries' weight, the ounce in which system contains only four hundred and thirty-seven and a-half grains. If this explanation do not quite meet the difficulty write again.

CAUTION.—It having come to the knowledge of the Publisher and Editors that a certain individual, on the strength of having recently furnished some correspondence to this Journal, has been alleging that he is in some way or other connected with the publication, and has through such misrepresentation obtained goods from London dealers in, or manufacturers of, photographic apparatus, they hereby caution the public against being misled by the misstatements of such person, should he still be in this country.

NEMO.—The cracked negative films may be restored by rubbing the surface with a pledget of cotton wool charged with lampblack. By adopting this simple process the cracks will disappear as if by magic.

S. D. W.—We received the two plates quite safely, so far as mere physical safety is concerned; but, owing to the notice stating they were *sensitive* plates having been packed up with the plates themselves, we opened them in daylight, by which they were, of course, quite destroyed. If you send others please adopt the ordinary precautions against a recurrence of such a mishap.

CIVIS.—As all the best makers advertise in the outside pages of this Journal, we can with confidence recommend you to study such announcements. We do not, under any circumstances whatever, offer advice as to what we believe to be the best apparatus. We are unable to give any description of the new Voigtländer lens, nor do we know anything about it beyond what has appeared or been recorded in this Journal.

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MASON'S CATALOGUE OF CHEMICAL APPARATUS.—From Messrs. Geo. Mason and Co., Union-street, Glasgow, we have received their new catalogue of chemical apparatus, appliances, chemicals, and reagents. It is an exceedingly comprehensive volume of 150 pages. It is well arranged and profusely illustrated, there being between three and four hundred engravings of chemical and philosophical apparatus.

PHOTO-OLEOGRAPHS.—We have been shown by Mr. J. Solomon, Red Lion-square, a number of what at first sight appeared to be oil paintings on canvas, but which, upon closer examination, were found to be photographs coloured in some mysterious manner not readily apparent. The effect, however, is most excellent, being precisely similar to that of the "poikilographs" of Signor Lombardi, of which we recently wrote. Whether they are produced in the manner, or by the process, described by the "Peripatetic Photographer" in his last *Notes* we shall not at present hazard an opinion; but as Mr. Solomon invites the attention of the profession to these photo-art productions, which are quickly and cheaply executed, our readers are thus afforded an opportunity of examining them for themselves.

THE BINOCULAR MICROSCOPE.—The author of the paper on the *Binocular Microscope for High Powers* (see page 412, *ante*), finding that he inadvertently omitted an explanatory foot note when re-writing the paper for publication, now supplies the omission as follows:—When stating in the closing sentence of the paper that, by means of a pivot at the junction of the axis of the two tubes of the binocular body of the microscope, they might be deflected until one of the tubes was made to stand in the line of axis of the object-glass, he omitted to mention that, so far as he was aware, this idea originated with an ingenious optician, Mr. Holmes, of Wardour-street. This gentleman, it may be remembered, read a paper at the Liverpool meeting of the British Association, in which he described his then new binocular microscope, in which the object-glasses were bisected. He has since improved upon this method, but the optical means employed have not yet been divulged.

DEATH OF M. LEVERRIER.—The death of M. Leverrier, the celebrated astronomer, of the National Observatory of Paris, took place on the morning of Sunday last, the 23rd inst. His ability has been thoroughly recognised in this country by the universities and learned societies—honours, medals, and testimonials having been liberally bestowed upon him. His name was first brought prominently before the world in connection with his wonderful discovery, simultaneously with Professor Adams, of the planet Neptune—a body the existence of which he discovered, and its exact place in the heavens he computed, solely from observing certain perturbations in other planetery bodies. Some months before his death he had fortunately completed the construction of most important tables relating to the positions of the sun and planets. In addition to his astronomical pursuits M. Leverrier was the originator, and in a great measure the conductor, of the Association Scientifique—an institution that has rendered great service in Paris. In 1848, on the breaking out of the revolution, M. Leverrier threw himself with characteristic ardour into the revolutionary struggle, but subsequently became an anti-revolutionist, and was appointed a senator of the empire of Napoleon III. He possessed a peculiar dislike for the constitutional monarchy and political institutions of this country; indeed it was felt that he committed a fatel mistake by entering the political arena, for which he was ill-suited. We conclude with quoting the eloquent words of a writer in the *Liverpool Mercury*:—"His hard words, however, on subjects which he did not understand cannot prevent our holding a torch at the grave of an illustrious son of science, unequalled in his own department, who saw so much of the august wonders of creation, to whom the dark vault of heaven was a vast peopled scene, and over which he gave the world a kind of empire in better and more accurate knowledge of majestic troops of stars for ever on the march."

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 909. Vol. XXIV.—OCTOBER 5, 1877.

ON ONE OF THE INFLUENCES AFFECTING DENSITY.

Of the many influences which operate to lessen the intensity of the developed image upon photographic plates, there is one which does not—at least at the present time—receive the amount of attention which is its proper due, though in years gone by the case was somewhat different. We allude to the action of mineral acids, especially nitric, either in the bath or otherwise; and, from the result of recent experiments, we believe this will be found to possess considerably more importance in connection with dry plates than it is customary to attach to it.

Going back to the early days of simply-iodised collodion, it was found necessary to employ a slightly-acid bath for the purpose of securing certain good qualities in working, and the choice of acids lay between acetic and nitric. The former had the greater effect upon the rapidity of the resulting plate; while the latter, though not materially altering the sensitiveness, tended to lower the density of the developed image. The introduction of bromo-iodised collodion rendered this difference in action less noticeable; but the general principle has nevertheless remained—that excess of nitric acid in the bath gives rise, amongst other evils, to enfeeblement of the developed image. We are aware that some years ago an American gentleman introduced a modification of the ordinary mode of working, the chief feature of which consisted in the employment of a much larger proportion of nitric acid than had hitherto been considered sufficient. The gain was alleged to be not only a higher degree of sensitiveness but also the production of a more vigorous result. Our own experiments with this method at the time of its first publication failed to corroborate this claim; and, so far as we are aware, such was the general opinion of those who tried it on this side of the water. We may, then, pass over the claim on behalf of nitric acid in this solitary instance as "not proven."

When, later, dry plates came into more general use it was found, if not necessary, at least beneficial, to adopt a more acid bath than was used for wet plates, and the ill effect of the increased quantity of acid, for some reason or other, failed in making itself so apparent. The reason may, perhaps, be explained if we consider the subsequent treatment of the plates, for it will obviously occur that during the washing necessary to remove the free silver nitrate the excess of acid would be also removed; yet, *cæteris paribus*, the fact remains that a plate prepared in a very slightly-acid bath gives a more vigorous result than when the dose of acid is much increased.

Turning to another phase of the question, we know that the general effect of the mineral acids when added to the developer is to produce a thin metallic deposit, while, on the other hand, the vegetable acids tend to produce a rich, dense image if used in moderation. It is not difficult to imagine how the various acids used in the manner last mentioned produce a more marked effect than when mixed with the bath; the effect thus produced does not, however, properly belong to the subject as we are at present discussing it, and is merely noted as a further instance of the difference in the behaviour of the two classes of acids. That difference may consist of two opposite effects, or only one—that is to say, the vegetable acids may directly increase the strength of the deposit, while the converse is the case with mineral acids; or the first-mentioned may, on the other hand, leave the original density intact, while the latter alone produces the difference. We think the balance of opinion is in favour of the latter view; for, though an old bath acidified with acetic acid may, under certain circumstances, yield images of great density, we are not aware that the addition of the same acid to a perfectly new bath is claimed to produce a similar result beyond what might be supposed to arise from the cleaner working of the bath and the consequently greater facility for intensification without the production of fog.

Some years ago, when employing an alkaline preservative, or, rather, when testing several in order to select the best, we were struck with the great improvement in the intensifying power which accrued. We were at the time working with a bromised collodion, and a bath containing a liberal dose of nitric acid; with an ordinary preservative consisting of gum, gelatine, or even tannin, the image was found to intensify with difficulty. When, however, the preservative was rendered very faintly alkaline the operation of intensifying was greatly facilitated, and negatives of the greatest density were easily obtainable. The washing in all cases, it may be noticed, was sufficient to remove every trace of free silver before applying the preservative, and with the silver we may suppose the acid to be also removed. Why, then, the difference in the behaviour of the two forms of preservative? Could it be due purely to the action of the preservative, *per se?* This we were unwilling to believe, as collodio-bromide emulsion plates treated with the same preservatives exhibited so little difference in behaviour that it was impossible to distinguish the results obtained with either. Recent experiments considered in connection with the results just mentioned lead us to the belief that the effect of the acid remains, only partially perhaps, after the total removal of the acid itself by simple washing; but that if a weak alkali be applied to the film, not only is the acid removed by its previous action, but neutralised also.

It will not be difficult to recognise the bearing which this may have upon our modern photographic operations, in which powerful acids enter much more largely than formerly into the preparation of our most sensitive surfaces; and it is in this connection we have been led to investigate the matter. We were first led to the question by a well-known phenomenon. In reproducing negatives direct in one operation by the recognised method of "reversing" an alkaline-developed bromide transparency, the greatest possible difficulty is experienced in intensifying the negative image left after the treatment with nitric acid. Prolonged washing produces very little effect; but if the film be flooded with a weak alkaline solution the difficulty disappears at once. It is immaterial what the solution consist of; it may be caustic or carbonated ammonia, soda or potash, or it may be one of the more feebly-alkaline salts. We have used phosphate and acetate of soda with advantage; but it is remarkable that a greater effect is produced by the application of the alkali previous to re-exposure than when the application is made immediately before development. This may possibly explain the *rationale* of the action of such substances as acetate of soda in facilitating the formation of dense images when used as suggested by Mr. W. Brooks.

Our first experiments were made upon plates prepared with the bath, the latter containing a pretty strong dose of nitric acid. After removal from the silver solution the film was washed very thoroughly in order to remove every trace of free silver and, according to the most delicate tests we were able to apply, of acid; a portion only of the surface was then flooded with a weak solution of one of the various alkaline substances already enumerated, and again washed and dried. Upon proceeding to develope an image upon the films so treated a very noticeable gain in vigour was secured upon that portion of the plate subjected to the alkali; but the difference was not so great as we had anticipated. When, however, the film was further treated with an organifier before drying the difference between the two halves was considerably more pronounced, especially when a preservative containing tannin or any of its congeners was employed. A distinctive colour was given to the deposit by the different alkaline solutions, but there appeared to be little difference in the strength of their respective actions. Bromised films exhibited a fuller action than bromo-iodised in the first stage of development; but during intensification the latter showed a greater readiness to acquire density when the alkali had been permitted to act.

The same relative gain was secured in those portions treated with alkali, whatever method of development was followed; but silver development, either with iron or pyro., failed in many cases to give a satisfactory result owing to a tendency to fog. This might be attributable to the imperfect removal of the alkali from the film; but, if so, the amount of washing necessary to render its perfect removal a matter of certainty would form a serious obstacle to the general adoption of the plan.

We next tried the effect of a similar course of treatment upon plates prepared from an emulsion containing an excess of about two grains of silver to each ounce, with one drop of nitric acid as the restrainer. The difference between the two halves of the plate upon development now became much more apparent, especially when the alkali was followed by an organifier, or when an alkaline organifier was employed—so much so, indeed, that whereas under ordinary conditions it was a matter of the greatest difficulty to secure printing density even by resorting to silver, the treatment with alkali rendered it a matter of great ease with pyro. and ammonia alone. Another noticeable fact was the ease with which an image might be originated with pyro. alone upon the portion of the plate treated with alkali, although the latter had been subsequently completely removed. An emulsion prepared in the same manner, but without the excess of silver and restraining acid, gave results so far negative that, though a difference was noticeable between the two halves of the plate, it was difficult to say whether it was a gain in density or only a modification of the colour of the deposit.

Finally: we prepared an emulsion with an excess of silver and divided it, after allowing it a sufficient time to "ripen," into three parts. The first was precipitated with plain water, the second with an acidified organifier as in Mr. M. Carey Lea's process, the third, after precipitation with plain water, was thoroughly washed to remove the free silver and treated with an alkaline organifier. The resulting emulsions, after re-solution, behaved very differently. No. 1 gave a clean, delicate image—difficult, if not impossible, to work up to printing density; No. 2 intensified pretty easily, but with a tendency to too great contrast; while No. 3 acquired density more readily than either, and gave an image with all the softness and gradation of a wet plate. We need scarcely enlarge further upon these results, but leave the matter to the judgment of our readers.

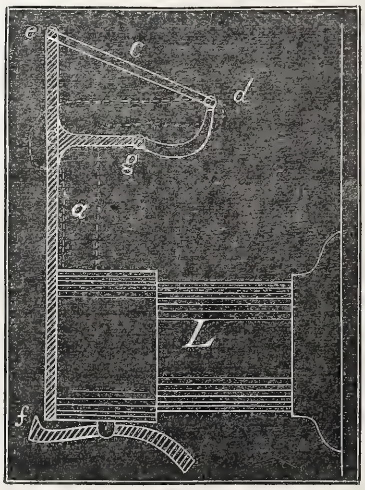
TRIGGER SHUTTERS.

Since our account, given a fortnight since, of the instantaneous shutter of Lieut. Fairtlough, we have devised one of a somewhat different kind, and which, while not better in principle, may yet approve itself to those who like to have a variety of such shutters at their disposal.

The one about to be described is a modification of the ordinary flap now so frequently used as a cap or shade to the lens. A short time ago, when endeavouring to take an instantaneous view by means of a lens fitted with a flap shutter, we found it quite impossible by its aid to cap and uncap the lens with a degree of rapidity permitting a sufficiently rapid exposure to be made. True, it could be done in a period of time less than half a second, but much greater rapidity than that was required. It was found necessary to effect the closing of the shutter by means of a spring by which it could be retained close to the front of the lens, so that the whole part to be played by the finger and thumb, by which the milled head of the flap was manipulated, should be the exposure of the plate, leaving the capping of the lens to be effected by the spring. This answered tolerably well, but it appeared susceptible of much improvement This improvement was eventually secured by means of two springs one acting against the other. Upon touching a trigger the flap shutter was instantly thrown up by means of a spring, which, by the act of the raising of the flap, was then thrown out of action, and another spring, acting in quite an opposite direction, brought into play. The result of this was that the shutter was opened with that degree of rapidity so easily secured by an energetic spring, and closed with an equal amount of celerity.

In carrying out this idea we found that several methods could be adopted. First of all to be considered was the method by which the shutter could be thrown up by the touch of a trigger. This, we found, could be effected either by a metallic spring or by an india-rubber band. We preferred the latter on account of its universality, there being scarcely a village throughout the country in which such bands cannot be obtained, and of every reasonable size and strength; and these, we conceived, should be made the media for securing elasticity. Metallic springs are, doubtless, good, but their adaptation is attended with much trouble and expense; while india-rubber springs, in the form of elastic bands, are neither expensive nor difficult to be procured. Hence we prefer india-rubber.

Starting with the ordinary flap shutter as a basis, it will readily be conceived that, if a rod or wire be extended from the shutter to the other side of the axis upon which it works, every movement will be continued in a directly opposite manner. This is in accordance with the recognised mode in which the ordinary lever works. If upon this extension the force of an elastic band were exerted it would have a tendency to throw upwards the flap shutter, and hence to uncap the lens. If the "pull" of the elastic band were at a right angle to the shutter when in a state of repose in front of the lens—a position to which it is supposed to be confined—ready to be released by the touch of a trigger, it will be at once seen that, when the shutter is fully opened, the band will slip over the end of the lever upon which it exerted its pull. It only remains at this juncture to provide for its being closed with equal rapidity, which, fortunately, may be done in a variety of ways.



In the annexed diagram we show one of the methods we have adopted; and, because it has elicited strong expressions of approval from several gentlemen to whom we have shown it, we submit it with more confidence as to its favourable reception by our readers. *L* represents the lens, which, for purposes of extreme rapidity, must be a portrait combination. Upon the hood or sunshade of the lens is fitted a stout brass ring, like that of a cap, which bears an upright piece *a* containing a wide saw-cut, so as to allow the exposing cap or shade to work freely within it upon the axis or pivot. To enable the other parts to be seen we show this upright piece *a* in dotted outline. A stout india-rubber band is shown at *c*, one end of which is fastened to *d*, which is a strong projection behind *a*. The other end of this band slips over the end *e* of the lever which forms part of the shutter; this, owing to its tension, would pull the shutter open were it not for the catch *f*, the opposite end of which forms a discharging trigger. There is a projection from the vertical lever that carries the cap-flap, opposite to the axis upon which it rotates;

this is shown at *g*. It is connected with *d* by a rather thin, and not too strong, rubber band, which, when the lens is covered, may have so little tension as almost to hang loose.

Having explained the various pieces of mechanism, we are now enabled to show in what manner the several actions take place.

Upon pressing the trigger at *f* the cap is released so as to be acted upon by the full force of the elastic band *c*, by which the flap is thrown up and the lens exposed. But this has hardly been effected ere the band has slipped over the end of *e*, and is rendered powerless to operate further upon it. No sooner is this done than the spring *g d*, now in a state of tension, immediately exerts its influence upon the lever to which it is attached, and pulls in an opposite direction, the result of both actions being that the lens is uncapped and capped with such great rapidity as to show in a photograph the feet of a horse in rapid motion sharply delineated.

A mechanical appliance of the kind here described may have been in use by others; we are not, however, aware of its having been so, nor are any of those gentlemen to whom we have shown it. But, apart from this, we can assure those who require an instantaneous shutter by which more rapid exposure is needed for the foreground than for the sky, that in the contrivance here described they will obtain all that can possibly be desired.

VARIOUS MODES OF OBSCURING GLASS.

A little while ago we devoted an article to showing the advantages and disadvantages of obscured glass in the studio; our present purpose is to discuss the various means of carrying out this obscuration. We showed pretty conclusively, we believe, that under certain conditions the use of obscured glass was of decided advantage, the principle governing its adoption being twofold in character—first, the breaking up of any ray received so as to lead a portion of the incident light into places which otherwise would receive no illumination and, secondly, the breaking up or "killing" of an over-strong light in such a way as to neutralise or destroy the harshness that rays, for instance, like direct sunlight would inevitably produce. It is, of course, obvious that the same material would be capable of performing the required duty in each case; but in practice a difference may advantageously be made in the selection of methods according to whichever of the two purposes is to be fulfilled.

The various media capable of being used to place in the path of the light may be divided into permanent and movable ones.

Among the former ground glass, with its congeners, occupies the foremost position, from its easy application in the first instance, and from the readiness with which it may be obtained. It breaks up the light very nicely, looks neat in the studio, but has only a moderate amount of dispersive action upon direct sunlight. Thus, when it is used for causing illumination to fall upon the sitter from a direction where no light comes, though it acts very well for the purpose a considerable part of the light pursues the course it followed when striking the glass, and thus the full amount of dispersion is not brought about. It also has another disadvantage, in that it gradually gets grey and yellow-looking with age, and after a while considerably reduces the actinic portions of the rays that do pass through. To some extent, of course, this can be got rid of by washing, but we think that, practically, there are very few photographers who periodically have their studio roof cleaned. If, however, they are to be cleaned soap must on no account be employed, soda being about the best agent that can be used when aided by a little friction with a brush.

When the object of placing the glass is the lessening the intensity of direct sunlight, one thickness of ground glass is insufficient, two at the very least being needed. When it is very brilliant they require additional aid. We are, of course, speaking of sunlight falling directly towards the sitter. Experiments we have made show, further, that two thicknesses of ground glass are needed to prevent the illumination of the air—that is, the motes and floating particles—when the sun's direct rays come across the field of view, the result in such cases always being fog. The effect of the ageing of glass also is to cause a greasy appearance, which acts to some extent as though the glass had been oiled, the obstructing and dispersing power being appreciably lessened after the glass has been *in situ* a few years. We need hardly observe that the roughened surface of the glass should face to the inside of the room, and not to the atmosphere outside.

In the same category as ground glass come fluted and hammered glass. These are not at all to be recommended for photographic use. The latter is not only heavy and expensive but is actually inferior to the ground glass, and the former also does not equal it, their only use being to intercept the view where there is a window with an awkward look-out.

Next among the permanent means is covering the glass with some material which assimilates its action to the varieties of glasses named. Such are the coating the surface with a film of crystals or of fine, white particles. The former has a very pretty effect, but is less suitable even than ground glass. We should not think that less than eighty or ninety per cent. of the rays it received were not bent out of their course, and we consider a crystalline film only suitable for the same purposes as the fluted glass. Still if anyone choose to make use of it he can cover a large space in a short time by making a strong solution of alum and adding to it anything of a glutinous nature—thin glue, size, old beer, &c.—and then painting it on with a sash tool.

One of the most common materials employed is whiting made into a fine cream, with or without size, and laid on with a brush, and then, while wet, dabbed with a cloth pad to make it more even.

Of all the methods we have seen employed the one possessing the greatest advantages was that where a window was coated with white oil paint in a very delicate manner. Certainly it was done by a house painter used to the work, but there was nothing in the process that could not be done by any handy man. The mode of procedure was first to coat the glass evenly all over with finely-strained oil paint, made of white lead and linseed oil (not boiled) with very little turpentine. The coating was then dabbed all over with a large, dry brush till all the first brush marks were destroyed, and a beautifully-even film was obtained, which seemed to disperse the light in a way that no other material we had ever seen had been sufficiently successful in doing.

From our brief explanation it will be evident that, by the same means, a coating of any degree of thickness or obstructing power could be produced. This might be done either by thinning the paint—that is, employing less pigment to a given amount of oil—or by laying the paint upon the glass in a thinner coat. We should thus be able, where direct sunlight shone in upon a room, to give a good thick coat which, though it destroyed the directness of the light, would yet leave sufficient to be active for the purpose of the illumination of the sitter; or, where no sunlight in the direct form came in, a lighter coating would enable one to get a good body of light thrown upon the sitter out of what without this aid would be a thoroughly dark corner, so far as the sitter was concerned. This coating, too, has a peculiar whiteness that suggests at once its usefulness as an illuminating agent.

We find we have already occupied sufficient space in treating of the more permanent forms of obstructors; we will return to the subject, and treat of the movable agents for light obstruction and diffusion.

ON THE USE OF THE ACTINOMETER WITH DRY PLATES.

[A communication to the Liverpool Amateur Photographic Association.]

The great uncertainty in judging the actinism of light at different times and different situations has always been a drawback to the use of dry plates in the field, resulting so often in under-exposed pictures. We find frequently the prettiest "bits" are in most secluded spots where much light is lost—how much we could only guess at—wooded glens, deep ravines, trees in the forest, and waterfalls, with rocks black with lichens hidden frequently from the light of the sun. How very seldom do we see these correctly timed? I look back with longing regret to hard and worthless attempts of former days, when all was guesswork. Though I often fail now to get good pictures, it is from other causes—such as want of sharpness and that great bane of photographers, a windy day, with nothing but foliage to do. When, therefore, a correspondent in The British Journal of Photography suggested the actinometer, its value at once struck me, and its use as a move in the right direction. To advocate and explain its use to amateurs is the object of this paper.

The actinometer I use is one issued some years ago by the Autotype Company in connection with carbon printing, and consists of a metal box about one and a-quarter inch square, containing a roll of sensitised paper, which is gradually drawn out, under a glass lid painted purplish brown, with the exception of a central slot through which the paper is seen. The paper deepens in the light until it assumes a colour similar to the paint around. This is known as a tint.

In ordinary summer sun, using Durand's paper, this takes place in forty-five seconds. If, therefore, under other circumstances it requires more than this, we know the relative strength of the light and the exposure in the camera must be altered in proportion. Thus, under similar conditions of time and light, a washed collodio-bromide plate, with Ross's rapid symmetrical lens, No. 1 stop, takes ninety seconds. When one tint equals (say) sixty-eight seconds the exposure necessary is 136 seconds. Practically I say such a lens, stop, and plate takes two tints, and if I expose plate and actinometer at the same time I must register two tints; thus it does not matter whether the sun shines, or whether the rain comes down in torrents, on the mountain top, by a wooded river, indoors or out, so long as the actinometer registers one tint twice I know all is right. If No. 2 stop be employed one tint only is sufficient; if No. 3 half a tint; and if full aperture a quarter of a tint. If either of the two latter the time must be known before the exposure commences. If a whole or more tint is given the two exposures may go on simultaneously. With other lenses and plates different exposures are necessary; each must calculate his own. Supposing, for instance, you would usually give five minutes with a certain stop: this is about equal to seven tints, and so on.

If the exposure is to be more than one tint, it (the measurement) had better go on together to the end. The varying light of a cloudy day is better managed than by simply multiplying the time of one tint as a guide for the remainder. Thus the first tint may occupy three minutes and the second only one, if the sun break away from the clouds. The only objection I have ever heard against this method is that you cannot always place the actinometer in the same strength of light as the subject photographed. I think you can—in most cases at least; and if you cannot it is surely a poor reason for discarding a valuable aid because you cannot under every circumstance avail yourself of it.

But, of course, judgment must be used in its employment. If the subject be in shadow it would be absurd to put the actinometer in the full glare of the sun. If the camera be in shadow, and the subject an open landscape, the actinometer must go out too. If the light be strong it is easy to measure it beforehand, and if weak you will have ample time for walking to and fro from shade to light. There may be cases of insurmountable difficulty, but I have never met with them. The camera itself, or one's own body, will give shadow if this predominate in the picture. One of the last pictures I secured was of a path through the woods, trees overhanging, and the sun behind—a difficult subject, for the camera was in the open facing the sun, which shone on the lens. Shading this and placing the actinometer at the back of the camera I gave three tints instead of two, and the result was good. I do not argue that the instrument is automatic. Open distant landscapes and snow scenes will still take less, and dark, heavy foliage always more, in proportion to ordinary objects. The judgment is helped, not dispensed with.

I have said that one tint is equal to forty-five seconds; this is in the sun, as we, in this cloudy, smoky part of England, are accustomed to see it. But on a bright day in the clear mountain air I have found thirty seconds was enough, and in other climes even less might do. I remember a remark made lately by one of our members to the effect that in Italy one-half the exposure was given of that necessary in England. By the use of the actinometer all doubt would be at rest. Thus I have noticed a February sun wants two to three minutes; a September sun, at one p.m., two and three-quarter minutes, and at six p.m. ten minutes, to form a tint. One cloudy day the light was so weak as to require fifteen minutes; and another, late on in the afternoon, twenty-five minutes. In a chapel where I tried it lately I do not think a week would have done it.

Take care always to use the same sensitive paper, as papers vary. I lost some pictures lately from having to beg some from a stranger, having run short of my accustomed Durand's make, and found afterwards it was much more sensitive, though it would not keep a week.

On a windy day an advantage is frequently gained by being able to cap and uncap the lens and actinometer at the same time, at intervals of rest in the foliage, without fear of losing count of time. Lately I adopted this dodge in taking an old house in a narrow street. By this means I escaped the blurs of passing carts and inquisitive Welsh children, who, not being open to reason, could not be driven away.

Of the actinometer itself little can be said. It is not a convenient shape, but is thoroughly efficient, being light-tight and almost air-tight, thus keeping the paper fresh. Those who use gelatine plates would like to register half a tint, and one could easily be made by altering the colour of the paint on the glass lid. A thinner instrument would be handier for the pocket. The Autotype Company make another form, more elaborate, for carbon printing, showing tint exposure from one to ten. This would be of value only to those who use the slow and sure processes, such as collodio-albumen.

I hope these few rambling remarks will induce amateurs to adopt the method recommended. I feel certain that if once tried it would never be abandoned. It is so easy and so certain, giving no extra trouble, and incurring no expense beyond the cost of instrument (two shillings and sixpence); while all anxiety is done away with, and failure from wrong exposure almost impossible. I know that old members of the fraternity will say it is of no use, and that they can calculate the time by the appearance on the ground glass. Still, all amateurs have not the requisite experience, and a safer guide than memory is often desirable, even with the most practised. No one prints in carbon without such a guide; yet, if the result were not good, it is but the loss of a print. Why, then, risk the loss of what might be a valuable negative, and which, perhaps, could never be replaced?

J. H. T. Ellerbeck.

THE ART OF PAINTING ON THE PHOTOGRAPHIC IMAGE.

No. VI.

In case of a very rough copy, or where for any other reason the drapery is very unsatisfactory, it had better be painted opaquely, as was the case in the old-fashioned miniatures. Indeed, in painting black cloth there is a peculiar charm in the method, because it gives a clothy texture that transparent painting scarcely does. Take ivory black, Chinese white, and sufficient raw umber to prevent excessive blueness, and mix a tint suitably dark for the middle tint; pass this all over. When quite dry, paint on the deep shadows with sepia and a little gum, and the highest lights with the middle-tint mixture with white added, but not too much of the latter; then mend and stipple where necessary.

It will be observed that the addition of white to any colour cools it, and this must be counteracted by warm colour added. In those few cases where it is desirable from extreme darkness to use body colour or white in a face, it will be found that more yellow must be added, or a pinkiness will be the result. This cooling of the colour will be observed in the tyro s attempt to colour a soldier's coat. This is no easy task, but as it is the national colour it is very necessary to master it. Vermilion seems to suggest itself as the likeliest colour; but, the groundwork being black, vermilion is utterly powerless to cover that blackness. If you add white, to make it cover better, you get an ugly purplish-red, not at all like a soldier's coat. Either you must get the photographer to paint out the coat in the negative and proceed as on white paper, having an untouched print by you as a guide, or something like the following method must be adopted:—

Take vermilion, or a colour called "pure scarlet;" mix a good proportion of white with it, and then add Indian yellow—or, better still, cadmium yellow—until it assumes a good scarlet tint. Add a little gum, and coat it thickly on to the black drapery, covering up lights and shades and everything. When quite dry, take vermilion with a little crimson lake and gum, and glaze all over with dexterous, large touches; then mix a lighter tint of vermilion, yellow, and white for the high lights. Put in the shadows with Rubens' madder, with, perhaps, some very dark touches here and there of Vandyke brown, using plenty of gum. If you have not a duplicate to guide you in the light and shade, you should if you are master enough of drawing, make a separate study, on a piece of paper, of the drapery.

A soldier's coat suggests gold lace. To render that satisfactorily I know of nothing equal to a deep wash of Roman ochre and burnt umber, sparkling lights of Roman ochre and white, with darks of sepia on the side away from the light. Reflected lights sometimes creep in of various tints, according to what happens to be in juxtapostion; for instance, the scarlet of the sleeve hanging over an officer's cross-belt often throws scarlet reflections on to it.

Green drapery may be represented by different mixtures of Prussian blue and yellows, the deepest shadows being largely mixed with burnt sienna. For purple drapery use crimson lake and French ultramarine; and for the deepest shadows burnt carmine.

Joseph Wake.

NOTES FROM AMERICA.

The State of Photographic Business in the United States.

Resuming from our issue of last week the Notes on the Present State of Business in America, as ascertained by the *Philadelphia Photographer*, we find that Mr. G. M. Carlisle, of Providence, in writing from that city, confines himself mainly to giving an account of the manners and customs which prevail in his own studios, an extract from which will doubtless prove acceptable to professional readers, especially, elsewhere.

The vignette, he observes, is the kind of portrait that is most acceptable to the public. My price for card vignettes is $5 per dozen and $3 per half dozen. My price for a card photograph, plain or in any other style but vignette, is $4 per dozen and $2.50 per half dozen. Of course we show samples of the different styles of printing, and the vignette is chosen by my patrons in nine cases out of twelve, which is very satisfactory to me; for I not only get the extra dollar per dozen, but I am enabled to give my patrons the style of picture I myself prefer. In my judgment there can be nothing made so neat as a clean white vignette mounted on a simple white mount, without gilt or other ornament. * * * Your next question is the most important for the proprietor of every gallery in the country to ask himself, to wit—"Do you find any improvement in the taste of the public, and do they appear to appreciate good work more than they formerly did?" I should answer most emphatically, Yes. The whole public, from the most ignorant to the best judges, seem to want the best they can get, and those who are at all able will pay for a good thing, and would feel ashamed to give in return for a picture they had received from a friend a picture that would at all appear to be of less value than the one they had received. If one of your friends should present to you in exchange for the best card you were able to procure a tintype or a miserable card made by one of the dollar-a-dozen men, that friend would not elevate himself very much in your favour. The public pretty generally understand this matter, and when their means will permit they will patronise an establishment where good work is done, and where a good price is asked and obtained. Your next question, as to what kind of light I use, can also be answered in one word, to wit, *weak*. I do not use more than half the light that I did ten years ago. My present light is what is known as top and side combined. It is of *white* ground glass, north-west exposure, and twelve by twenty-two feet, the top light being twelve by fifteen, and the side light twelve by seven; the pitch of top light being about forty-five degrees, and the lower part reaches to about nine feet from the floor, where it rests on the side light, which extends to within two feet of the floor, but curtains cover nearly the whole light and only a subdued light reaches the sitter; but there is much humbug about this light business. If the operating-room be of good size you can find a favourable spot beneath most any kind of light for the sitter, and excellent results are often produced beneath what would be termed a bad light. Very much more, in my opinion, depends upon good management of light and shade than the particular angle, the point of compass that your light enters, or whether the glass be ground or plain. Yet I should want to avoid a glass the colour of which would give any colour to the light in the room. If brick or other objectionable buildings surround your operating-room I should, by all means, use *white* ground glass, and, as I said at the Buffalo Convention, "filter your light more and your bath less;" for, if a light be objectionable in colour, after it has passed through a white ground glass it has been filtered of its objectionable rays, and will be found white and works quick; in a word, I can get along with but little light if it be *pure white*. You ask if I am in favour of fancy backgrounds. I would say that I do not wish to be without several, yet I have always been more successful with a plain ground, and believe a woollen, with a shade of grey adapted to your light, the very best made. Composition pictures would, no doubt, be more admired and sought after if there were not so many shown that were at once ridiculous. Every person of sense who has examined a dozen composition pictures made with fancy backgrounds could discover something in eleven of them that, as the street gamins say, would "give them plumb away," or, in other words, could discover some blunder made in the composition that made the picture a botch if not an impossibility, and for this reason I confine myself pretty much to what I am most likely to make a success. The land is large enough and firm enough for me to walk upon, so I keep out of balloons. I am making pictures which I find very pleasing, and call them "paragon portraits." The negative is made on a plate 18 × 22, and, when finished, cut out about 17 × 21, and mounted on board 22 × 28. I seek to imitate the old style steel engraving of about that size. The figure or figures are not larger than is usually made on 10 × 12, or say figures not more than from eight to eleven inches; this enables you to display furniture, &c., to good advantage without crowding at all. I charge $10 for making a negative, and $5 for each finished print, which, although a very low price, I had much rather do than cards at $5 per dozen. You ask my views as to price. They are these: I believe any man, whether of more or less experience, will be better off to charge a good price for his work, and a man will bring to his gallery just such a class of trade as he caters for. If his price is well up he shows the public at once that he places some value on his work; whereas, if his price is below the average, he leads the public to think that he does not himself consider his work up to the standard, for if he did he would ask as much as others. Of course this reasoning is subject to location to some extent.

Mr. H. L. Bingham, writing from San Antonio, Texas, begins by defending the good taste of the Texans in matters pertaining to photography:—

Away out here on the frontier it might be thought there would be little taste manifested for the photographic art. I assure you it is quite the contrary. The panic which has depressed business enterprises of every class throughout the country has been but little felt here. This is somewhat attributable to the products of this frontier country. Cattle, wool, and cotton being the chief, find ready markets and at good prices, and the cattle market has been remarkably good this season, consequently the prospects are that all branches of trade will be good this coming fall and winter. The present style seems to be the vignette in grey, which, I must say, is beautiful when properly handled. Cabinets and cards are the prevalent sizes, and a large proportion are cabinets. I seldom make less than one dozen from a negative, which I get $12 for, and $8 per half dozen; cards $5 per dozen, and $3 per half dozen. I find people will pay good prices for carefully-finished work, and at present I have adopted the plan of doing my work myself, and thus use the proper care in having it well done; and I am satisfied this, with me, is much better than trusting to such help as I am able to hire. I find a decided improvement in the taste of my patrons, and frequently the remark—"If you can do better by giving more time and pains to the work do so, and I will willingly pay extra for it." In my experience of twenty-five years and over in the photographic art the class of people who form the greater portion of my patronage are willing to pay good prices for good work, and I must say I believe photographers who are continually dropping on prices, in an effort to secure trade or an increase of trade, make a great mistake. They not only lower themselves in the estimation of the people—to that class who are such poor workmen that the inducement they offer of cheap work is the only recommendation they have—but they fail in this, that they do not increase the receipts so much as the poor work. The time has passed for the better classes to be thus induced to patronise inferior workmen. The inducement of cheap work is not sufficient to secure a class of patrons that are sufficiently cultured to desire anything excellent, and I do not believe it is policy for one who has any respect for the art to reduce prices to such an extent as to cause slighting their work, which it does. Good prices give tone and character, and this is what refined tastes admire. I make but few photographs with fancy backgrounds, as such are only adapted to full-figure pictures, which I do not consider advisable for card or cabinet, as it makes the face too small to give a faithful likeness and enable the proper display of light and shadow. In 11 × 14, or larger, full figures will answer very well. The bust or head and shoulder photographs have become somewhat hackneyed, yet in a majority of cases I much prefer them to full figures. Light is a subject which has been pretty thoroughly discussed, and one which seems to me of much importance; but I have found in my practice that not so much depends on the peculiar form and size of the light as in the mode of handling the light. I use an ordinary side and skylight. The size of skylight is 10 × 15, the side light running from within two feet of the floor to the skylight, where the two sashes meet. I have been in Texas four years, and when I went north in April I expected to find myself far behind in many things. I, however, found my work much like that I saw in the cities I visited. I was in Baltimore, Washington, Pittsburg, Cleveland, Chicago, St. Louis, and other cities. This was quite a surprise to me, as I believed I had been in this far south-west country so long I might have lost some of my spirit, and retrograded instead of progressed. I, however, do not think there has been much progress within three or four years. Photography seems to be resting awhile on its already-won laurels.

From Minnesota, Mr. Charles J. Stiff, of St. Paul, writes:—

I predict that business this fall will be brisk, for the reason of there being an abundance of wheat and other grain now going through the process of harvesting. In 1872, when I first came to this city, there were no cabinet photographs made to speak of; now, with me, fully one-third of my orders are for the cabinet size. My prices for cards:—$3.50 plain, per dozen; $4 for vignettes; cabinets, $6 per dozen, either plain or vignettes. Yes; I think the public understand better what constitutes good work now than they did ten or fifteen years ago. My observation for the past seventeen years has been this—that the photographer doing the best work has the most custom, and does the best business. In regard to prices: I claim that photographers should do *good work* and get *good prices;* not exhorbitant prices, but such as will justify them in finishing their work up in *first-class style*. I believe in one price, too, to all customers; but many photographers fall into the error of charging several prices for the same work, making the price to suit the customer. I think that locality and class of gallery should govern the price of pictures, good work considered. My light is a top and side, plain glass, facing north-west; top light set at an angle of 40° or 45°, about ten feet to the lowest pitch. I think for full figures that a fancy background is more acceptable than a plain one. I am sure my orders run that way; in fact, by looking them over, I find the fancy grounds preferred. The bust figure and a well-lighted head seem to be the choice of the public, and I glory in it, for what is there for a photograph that is nicer or more artistic than a beautifully-lighted head?

We shall resume these interesting experiences in our next issue.

NOTES ON PASSING EVENTS.

By a Peripatetic Photographer.

Who would have thought that after having been allowed to pass almost into the limbo of forgetfulness the once well-hacked subject of auxiliary exposures by means of exposing the plate to coloured light should be again resuscitated, and, not only so, but form a subject for which a patent has been obtained by an enterprising Belgian? It cannot be that any patent taken out in connection with supplementary lighting will be greatly respected in this country; but it must at any rate prove complimentary to those who at a former period have asserted, if not proved, the possible utility of the scheme. But to *patent* anything in such a connection, and in the year 1877! Have Belgian photographic journals no English correspondents?

What is the matter with the South London Photographic Society that it appears to have given up the idea of holding a technical exhibition this year? It may be that it *is* to be held; but, if so, I, at anyrate, have failed to discover any public announcement of such fact. Although the exhibition last year was confessedly far from being successful, I thought there was sufficient pluck among the members of that Society to make another attempt. If they still intend holding it at the usual November meeting public attention ought to have been called to it several weeks ago. Can it be that this once energetic Society is getting into a moribund condition? I hope not.

Carbon printing is having its innings at present. I, as an old carbon printer, rejoice to see the amount of publicity accorded to it. "May its shadow never grow less!"

And Talbot has gone! Ought not a public monument be erected to the memory of a man who has done so much to revolutionise art and art methods? If the Photographic Society of Great Britain do not immediately take some steps to show their estimation of this great man they will be altogether unworthy of the name they have so recently selected for themselves.

Noticing the machine for mixing emulsions invented by M. Aloerginat, I take the liberty of observing that one of the best and readiest methods for mixing an emulsion consists in introducing into the bottle a quantity of clean-washed and very small shingly stones, such as may be picked up everywhere by the handful, more especially at the seaside. With a few ounces of these in a bottle of emulsion a brisk agitation of the bottle will very soon effect a thorough commingling of the ingredients of which an emulsion is composed.

(To be continued.)

PICTURES FROM LIFE.

From the Scrap Book of a Photographer.

[A communication to the Glasgow Photographic Association.]

In addressing you on the present occasion I think I cannot do better, in the interests of our art—instead of confining myself to any particular phase or process in the manipulation of photography, or even improvements that may be looming in the distance—than take a discursive survey in connection with our general history, and the many and varied incidents always sure to occur in taking the likenesses of others. Neither will it be necessary, I think, to give more than a brief outline of the early history of the art in Glasgow.

The first incident I remember connected with photography was seeing a daguerreotype shown to me by a friend, and which at the time was thought a very great mystery; but what puzzled us most was a crack in the glass of a window. At that time it was argued by artists that it was a very clever dodge executed by the hand. At the period referred to our brethren of the black art were executing their beautiful black profiles; but these were being rapidly superseded by the daguerreotype, which had now obtained a firm hold in the West of Scotland.

I think the first place daguerreotypes were taken or shown in Glasgow was at the Zoological Gardens, in the New City Road, and the next by a Mr. Picken, at the Andersonian Institute, in George-street; then came Messrs. William Gardner, Bernard, Young, White, and Miss Descerne. I remember having my patience sorely tried when sitting on the top of a house in Buchanan-street with the full glare of sunshine beating on my face for a quarter of an hour. The operator told me not to move till he came back, as there was somebody in the shop requiring attention. I will never forget what I suffered during that terrible sitting. But, notwithstanding every drawback, the art was making favourable progress.

The first glass house I recollect having seen was a curiously-constructed, fantastic erection, at the top of Buchanan-street, and which had an out-of-the-way appearance. There might have been seen a mysterious little man gliding out and in, and whom the youngsters regarded with indescribable awe.

The only system I can remember by which daguerreotypes could be multiplied was introduced by Dr. Paterson, of Glasgow—an early and successful amateur. This system consisted in taking an electrotype from the original, and which was nearly as good as the first plate. Most of us have heard of Mr. Kibble's large glass positives, especially his view of Gourock Bay, which measured four feet by three, and all sharp to the very edge. Among other early enthusiasts in improving and forwarding the art were the Messrs. Mactear, who, I believe, were the first to possess a camera in Glasgow.

In going through the streets of Edinburgh you found the names of Messrs. Ross and Thomson, who were producing excellent paper prints from paper and albumen negatives. The names, also, of Papowitz and Howie might have been observed, the latter having a bill at his door announcing, in all seasons—summer and winter—"A good light today for taking portraits," so that a blank day never occurred.

Amongst the early professors of the art we had Mr. Bernard, an English artist, who professed to colour his daguerreotypes in the camera by chemical agency. But Dr. Paterson soon exploded that by showing the powder colour on the plate by means of a powerful glass. Mr. Bernard went to London, I am told, taking with him £3000, and shortly afterwards stood as a candidate for parliamenty honours for an English borough. The last I heard of him was as managing director of a large boot and shoe factory.

Then we had Mr. Young, who would keep advertising "Come to Young and Sun, and see yourself as others see you." Though I don't think he ever had a son, yet the same sun is the sole partner of our artistic existence. Mr. White, and also Mr. Hughes, produced excellent daguerreotypes, the former sending out high-class paper pictures taken on plain salted paper, and toned by the hypo-gold bath. Mr. McNab took Glasgow by storm with his coloured photographs, painted by the father of the present Alexander Brothers. Mr. Taylor and Mr. Annan, and a host of others, rapidly followed those just mentioned.

At this period there was also a foreign artist, Herr Bibo, a good German painter. His glass positives were the best I have ever seen. Things went against him, and he was sold out. Then there was also M. Descerne, one of the masters in the School of Art. He did not succeed, however. And then we had the Brothers Maguee—very good French artists, and among the first, I think, who produced artistically-coloured paper pictures here. Their career was cut short in consequence of their studio in Buchanan-street having been destroyed by fire, and I am sorry to say they lost their all. Last year one of these poor brothers died of starvation in London while engaged on a historical picture. It is strange that not one of the foreign artists who have had establishments in Glasgow, although all good artists in their way, has been able to succeed. Is it the want of artistic taste in the people? I think not, but rather the want of commercial enterprise in the artist.

Then came Greatrex, the street preacher, who had too much enterprise. Photographing faces was too slow for him, so he tried the making of bank notes, and for this exercise of his inventive genius was transported for forgery. He tried to come over the Scotch by the religious dodge, assuming sanctimonious airs, and, the better to show off his zealous piety, he had his show-room hung all round with scripture texts.

But great as was the advance so far made, a change was imminent in the introduction of glass positives, which completely drove the daguerreotype from the field. Glass positives were in turn superseded by the *carte de visite.* A number of artists stood out against these diminutive invaders, thinking they would not pay. But it was of no avail; on they came like an avalanche, and we could not withstand the shock.

The prices at first were good, but competition soon brought things to the lowest ebb. The system of "favour cards," or half-price tickets—at first sent out clandestinely—very soon became general, and brought down prices so low that a number of artists could not live. But now I think we are better paid, although we have not so much to do. I am afraid, however, that ferrotypes are taking a hold of the public mind, and will prove very injurious to the profession, as there is so little remuneration to be secured by their production. There is another system making some advance; I allude to the club system, which is now being persistently pushed in the direction of enlarged pictures, done at so small a price as in the end to prove detrimental to the interests of true art.

Being a wood engraver, and having frequently to copy daguerreotypes for woodcuts, I conceived the idea of daguerreotyping on the block by first blackleading the wood and afterwards electrotyping a thin film of silver over the blacklead. Having succeeded in taking a picture on this film I found it impossible to engrave it, owing to the graver lifting the film off the wood. But when the collodion process was introduced I at once applied it with success. Having blackened the surface of the wood with a solution of albumen and China ink, I next polished the block with blacklead, and went through a similar operation to taking a errotype, only the dark slide had to be sufficiently thick to admit the wood block. I also managed to daguerreotype on the block by forming an iodide of silver on the blackened surface, exposing to light, and developing, then polishing, and going through the same process as for a daguerreotype plate. I have likewise used this method successfully for daguerreotyping on glass. If the film were disturbed with the graver you had only to hold the picture over the fumes of sulphuric ether to make it sink into the wood, and by this method I found an immense saving of time in my business.

At this period my time was in a great measure taken up by the visits of friends anxious to see the new process, and I was strongly advised to start the taking of portraits as part of my business. Accordingly I broke out a large window in my garret, sent an advertisement to the *Herald*, and by the end of the week my rooms were so crowded with visitors that I had scarcely room to move. A rush so rapid and unexpected I thought could only be of short duration; but, to my surprise, on they came, until my sanguine prospects were brought to an abrupt termination by an accident which occurred. I was making some collodion, and to get the iodide of potassium dissolved I put the bottle containing the ether and alcohol into a pot of hot water on the fire, and was suddenly called away. When I returned, and bent over it to take it off, the entire contents were ejected on to my face and head. The latter was instantly in a blaze, and was soon left in the charred condition of a singed sheep's-head. This unlucky mishap proved a prompt extinguisher to my likeness-taking. I became an invalid for two weeks; and, as there were no assistant operators to be found in those days, I had to put up an intimation at my entrance—"Blown up! Will be down in a few days!" Shortly after this the rush was so great that I was obliged to cover three blocks with glass houses.

About this period another accident occured—quite as alarming though not so serious. In making some gun-cotton I had placed it before the fire spread out on a paper to dry. A toaster with chops frizzling for supper was there, and to my astonishment I caught sight of the chops and toaster making a summersault in the air. The cotton had exploded, and supper and all were gone.

I have had English, Irish, and Scotch operators; also French, German, and American artists. The Yankee was too cute for me, the German too slow, and the Frenchman too demonstrative. The Cockney could do everything—with his tongue; and an Irishman I had, not being so well seasoned with alcohol as the Scotchman, suddenly terminated his artistic career and existence by taking an over-dose of methylated spirits in the dark room. I need not say what were the merits of the Scotchman. He was like the Irish catholic who told a fiddler to play a stave or two of the tune of "Boyne Water" to ascertain how he could stand it; but in a minute after he roared—"Stop that wid ye, or I'll break yer head!" Now, I am afraid my head would be found in a similar predicament.

Apart, however, from these details, it will be admitted that the working of our art occasionally brings out many curious and quaint, as well as noble and beautiful, traits of human character; in fact, the inmost desires of the heart come forth without disguise. But, before referring to these particularly, I may be permitted to mention the gratifying fact that Photography is not lagging behind the sister arts, but keeping abreast, and, as she is essentially a creature of light, ever glad to embrace any additional light science can throw in her way.

In almost every branch of scientific progress our art is required—the artist and the mechanic alike claiming her services. But while willing to aid in the workaday pursuits of life, she claims a dominion of her own, in which she has no rival—the beautiful task of transmitting to other generations the loved features of those who were pleasing in life and who shed happiness around, photography thus far adding to the sum of human enjoyment.

I cannot help feeling that, in working out our art, if temper and philosophy are required by any branch of professional men, surely the photographer should be included in the number. We have every variety of face and expression of feature to deal with—from the squalling babe to the hoary-headed pilgrim who has all but completed life's journey. We have the buxom damsel, florid in the radiance of robust health, and the languid and sentimental lady; the perfumed Beau Brummel of the period, and the easy-going hero of unnumbered jollifications. In short, we have every variety of habit and character—the cute sinister lawyer and the starched, grave divine; the rattling soldier, bent on "seeking the bubble reputation even in the cannon's mouth," and the rollicking tar, who cares not a quid how stiff it blows. Surely, if the face reflect the true disposition of the human being, and having such diversified *data* to work upon, a photographer should be a clever adept in deciphering the various phases of human character.

If occasionally we have the pathetic side of the picture in delineating human nature, we have far more frequently the ludicrous. There is, however, one thing to be found in common among this endless variety—everyone likes to put in a good appearance, and our patrons all expect to appear handsome or beautiful, no matter how the case may stand. "Well, sir," said a customer to me one day, before taking his place before the camera, "do you know I am an author, and I want you to make my picture the same as if I were studying a grand poem!" I looked at my sitter sceptically, and did my best to please. Luckily he chanced to be of the beetle-browed order, and the haze thrown on the lower features by the malformation made him exclaim—"That all arises from study and deep thought!" A fashionably-dressed young swell one day called and showed an advertisement purporting to be written by a lady anxious to secure a suitable partner, who must be amiable, good-looking, and intelligent, and she having an ample fortune at command suitors must send their *cartes*. "Now, sir," said he, "you understand my case; put into my face all the virtues there stated, and who knows but I may be in time to win the bride!" I could not help smiling at the suggestion, and reminded the silly fop that I would give him a picture his friends would recognise.

On such occasions all will admit that we are sometimes sorely taxed in the effort to please the fastidious, especially when combined with a sprinkling of coxcombry. "Now please observe," said one of this class to me, "that I am a professional vocalist, and can command any amount of applause by my flexibility of features and unequalled voice; I wish your picture to convey that idea!" In this instance I had some reason to know that my client's estimate of himself was by no means exaggerated; but, then, I had no means of giving him flexible features.

I have often seen, when a large family group was to be taken, some very interesting traits of character. I remember on one occasion, just after the settlement of the Crimean war, a venerable old man with white flowing locks calling with his "better half"—the very type of the shrewd Scotch matron. Three stalwart sons and a couple of interesting daughters completed the family group. The old lady undertook to give all the directions. "Thae five," said she, "is a' left us oot o' thirteen. Davie, the youngest, was killed when followin' Sir Colin at the Alma, an' Johnny, the auldest, left his banes in the backwoods o' America. We're noo married fifty years, an' mony an up an' doon we've seen, an' I want this pictur before ony mair are ta'en awa'."

But all these feelings may be said to reach their climax when the photographer has the sad duty of bringing his camera to bear on a lifeless face in the coffin. I have been frequently called upon to do this, and have witnessed scenes of frantic grief I will not venture to describe. No sooner is the picture handed to the doating relatives than it is kissed over and over again amid streams of affectionate tears. Well, such scenes are just a part of the chequered web of life, and only enhance our other enjoyments. JOHN URIE.

(To be concluded in our next.)

UPON THE DETERMINATION BY PHOTOGRAPHY OF INFINITESIMAL SPACES OF TIME, &c.

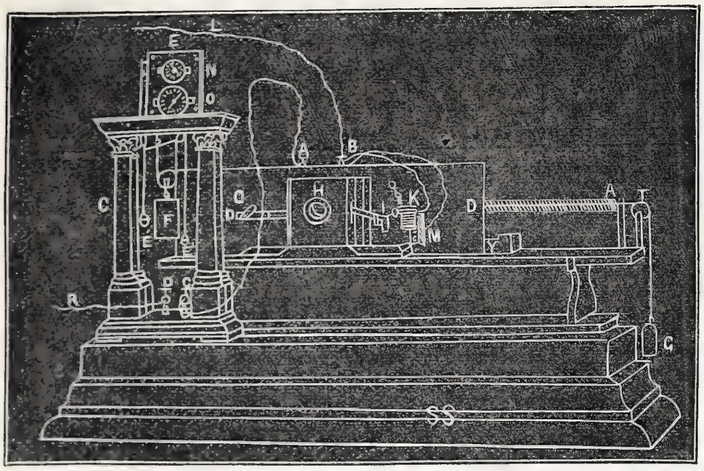
IN a former article, in speaking of how to photograph sounds, I described an apparatus in which the dark slide was drawn past the objective in a very short space of time by means of a spring. Previously for every sort of instantaneous photograph the opening and shutting of the cap of the objective was done by hand, the cap being removed before the exposure began, and replaced again with the hand when the exposure was finished, while the slightly-active rays of light, which could do mischief before the direct commencement of the action of the light, were warded off by a pasteboard screen.

In the course of my experiments, however, it appeared that this practice was based on a misconception, since the beginning and the end of the photographic curve could not be fixed with absolute exactitude with reference to the time of the entrance of the light; so that when work was undertaken specially with a view to calculate the duration of infinitesimal, physical, or physiological movements, a method must be found by which the following three conditions might be fulfilled in a moment:—1. The opening and shutting of the lens. 2. The simultaneous drawing up of the shutter of the dark slide. 3. The commencement of the action of the light.

Owing to the rapidity with which the necessary auxiliary movement must be brought to bear on the apparatus, I could only hope to obtain the desired result by means of an electric current. I, therefore, set myself the task of arranging for the automatic opening and shutting of the lens by electricity, and with the following combination I have reached the desired end:—To the board D D, in *fig.* 1, to which the small box camera *h* is screwed and behind which is the sliding dark slide shown in *fig.* 2, an electro-magnetic contrivance is attached. It consists of a double iron core round which a great number of copper wires are wrapped. Above this small electro-magnet there is a weak iron crossbar *k;* from this crossbar a lever arm *k i* extends, which in turn is connected by a link with a second lever *i h*. At the end of the second lever *h i* a round black pasteboard slide *h* is fastened, which closes the opening in the camera into which the objective has to be screwed. In the slide of the camera lying between *i* and *h* a very narrow slit is made, so as to allow of the lever *h i* moving without rubbing against the sides; the slit is also cut so as to allow no light to pass through and fall upon the plate which is drawn past the objective opening *h*. Above the electro-magnet *m k* is a small spiral spring *k l*. When an electric current circulates round the two iron cores *m* they become magnetic and draw the crossbar *k* towards them. When the crossbar *k* is attracted it raises the lever *h i* at *i*, and when the lever *h i* rises at *i* the second lever *i h*, which is linked at *i* to the first, sinks with the lid *h* in front of the objective, and as long as the electric current remains unbroken the lid of the objective *h* remains closed. The instant, however, that the current is stopped the magnet *m* loses its hold upon the crossbar *k*, which is drawn upwards by the spring *k l*, thus raising the double lever of the lid at *h* and opening the lens.

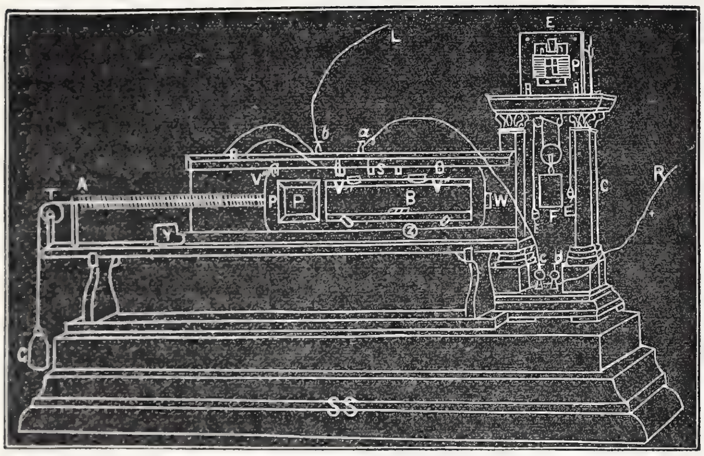
If, then, the electric current be quickly turned off and on at *m*, the cover of the objective *h* will as quickly spring off and on. This contrivance, so far as it has already been described, may be connected with any photographic apparatus with which one desires to take instantaneous photographs, since, as I shall hereafter show, the exact time required for opening and closing the apparatus is scarcely one-five-hundredth part of a second.

FIG. 1.



But the apparatus is not only adapted for instantaneous views, but for the representation of movements which have a certain, though very short, duration. To photograph such movements the objective should only be open exactly as long as the light curve, which has to fix the movement on the sensitive plate, lasts. In order to ensure this I have myself opened and shut the lid of the lens in the moving dark slide, in the following manner:—

FIG. 2.



Three brass pegs, v' v'' v''', are fixed by one end to the dark slide B (*fig.* 2), while their other ends are laid upon the two springs *r x* and *x s*. The springs *r x* and *s x* approach at *x* to within half-a-centimetre of each other; and are connected by wires at the nuts *a* and *b* with a galvanic battery. The galvanic current can, however, only run from *s* to *r* when one of the pegs, v', stands before *x*, as by this means the two springs which divide the current are brought into connection.

Let us suppose the peg v' to remain still in front, forming the junction between the two springs at *x*, then an electric current coming from R passing through *a* towards *s*, would go from *s* to *x* v', and from that to *r*. From *r* the current goes to the other side of the apparatus (see *fig.* 1) to the magnet *m*, goes round it to *k*, then proceeds from *k* to *b*, and from *b* by the conducting wire L back to the battery. While the galvanic stream is completely closed in this way the lid of the objective is shut in the way described above. The moment, however, that the peg v' (*fig.* 2) leaves the springs *r x* and *x s*, the galvanic current is interrupted, and the moment the current is broken the attractive power of the magnet ceases and the lid of the objective opens. The dark slide is drawn by the spring A, upon the wheels already described in a former paper, across the objective until it reaches a snap at *y*, which hinders it from rebounding. At the instant the dark slide stops the second peg v'' springs into the space at *x*, and completes the electric current. At the same instant the lid of the objective shuts also and stops the entrance of light. By the action of the electric current, therefore, the objective remains open for the passage of actinic light during the time the movement stretches from v' to v''. The sliding lid of the dark slide is likewise moved automatically, at the same moment as the rest of the movement begins, by the spring peg *g* (*fig.* 1), which springs into a small hollow in the lid of the dark slide. During the movement of the dark slide, therefore, its easily-moved lid does not go along with it, but is held in its place by its pin, so that the slide itself passes openly in front of the lens. A second check pin is placed at *z* (*fig.* 2); if this be drawn out by hand the smallest possible distance the drawing power of the spring A immediately comes into play, and the dark slide speeds on until it reaches the snap at *y*. With the spring I have attached to my apparatus the time occupied by this drawing motion is one-tenth of a second. In the course of this time a curve fifteen centimetres long is photographed.

In order that the dark slide may move along at a steady rate an arrangement must be made which shall equalise the pulling power of the spring, when it is first let go, with that at the end. This may best be done by adding a hanging weight. In our illustration a cord goes through the whole length of the spiral spring to its point of junction with the dark slide, which runs over the roller *t*, and carries at its opposite end a weight *g*, which exercises by its fall the same power that the spring does in pulling, only the variation of the two powers is reversed. The power of the falling weight increases as it falls; the spring as it draws loses in power. If the spring draws itself together and takes the dark slide along with it from *r*, the weight *g* falls at the same time; and the weight falls the quicker and exercises so much more power the nearer the dark slide approaches to *a*, while, at the same time, the spring loses in power. The increase of pull from the weight, therefore, equalises the decrease of pull of the spring. The proper proportion may be reached by using as a weight a hollow vessel, into which as many small weights may be placed as shall be found necessary to make it equal in power to the spring when first let go.

When the time required for the passage of the dark slide has been fixed, it is easy, by calculating the divisions of time and measuring them off, to distinguish the effect of the action of light in the curve as produced at each separate moment of time. But whenever there is a question of a quicker or slower passage of the dark slide, then for each exposure the time taken must be determined anew. For this a very practical instrument, constructed by the celebrated horologist, Hipp, of Neufchâtel, serves, which is used in physics for the determination of the most various minute intervals of time. This instrument C (*figs.* 1 and 2) consists of very fine clockwork moving two dial hands. The circuit of the upper dial *n* is made in one-tenth of a second; that of the under dial *o* in ten seconds. Each dial is divided into 100 degrees, so that each degree of the upper dial is equal in value to one-thousandth, each degree of the under dial to one-tenth of a second. The clockwork E is set in motion in the ordinary way by the weight F; the ropes *e e'*, are connected with a break which serves to stop the machinery or to set it in motion.

When the clockwork is wound up and the break is placed out of contact with the wheels, the hands are set in motion as soon as one pulls the rope *e*, and stand still when the power of *e'* is exerted. The hands may, however, also be made to stop by the electric current by a magnet being placed behind the clockwork E at *p* (*fig.* 2), which, when the current reaches it, attracts a crossbar, which in turn is connected with a pin acting as a break by biting a wheel in the clockwork. The whole contrivance is inserted into the course of the electric current between *c* and *d*. If the peg v' (*fig* 2) closes the chain of the current, the magnet *p* acts immediately, and stops the clockwork. During the time, however, that the dark slide passes from v' to v'', and the electric current is broken, the magnet *p* ceases to act and the clockwork goes. Now, in order to determine the time that elapses during the passage from v' to v'', before removing the peg Z, a note should be made of the position of the index upon both dials. For instance: if at this time the index of the under dial point to 70, and that of the upper to 20, and if, after the passage of the dark slide, the under dial indicate 71 and the upper 55, we know that $\frac{1}{10} + \frac{35}{1000}$, or $\frac{135}{1000}$ of a second was the time required for the passage of the plate in front of the lens; or, rather, that the action of the light had lasted 135 thousandth parts of a second.

From this result, the time required for the iron cores to become magnetic, as well as that employed in attracting the crossbar towards them, must be deducted. The time occupied by these operations is ascertained by so-called differential experiments, and it is for this purpose that the third peg v''' is fixed to the dark slide. In order, then, to subtract the difference, the whole dark slide carrying with it the matt slide P is passed along, then it is put back and only the part from v' to v'' is allowed to pass. The whole apparatus is prevented from shaking by being screwed upon a heavy lead-covered socket, SS.

There are numbers of experiments in physics, in physiology, in various other sciences and arts, in which the above-described method of scientific investigation may and will be used, since the graphic methods hitherto in use are only practicable up to a certain point. These consist, for instance, of the mechanical drawing of the movement by the friction of a bristle upon a soot-blackened revolving cylinder. The results are here always liable to injury by the rubbing off of the blackened surface. By the apparatus described all friction is, on the contrary, done away with by the combined employment of electricity and photography; and for this branch of scientific investigation it may be safely affirmed that in future the photographic method will have things all its own way.

S. Th. Stein, *Dr.*

—Photographische Correspondenz.

Meetings of Societies.

GLASGOW PHOTOGRAPHIC ASSOCIATION.

The usual fortnightly meeting of this Association was held in the rooms, 172, Buchanan-street, on Wednesday evening, the 26th ult.,—Mr. John Stuart, President, occupying the chair.

The minutes of the previous meeting having been read and confirmed,

The Chairman, in a few words, thanked the members for having again elected him to the honourable position of President—an honour he esteemed very much, though, considering how often he had been absent from his post last session, he felt as if they should have elected one whose attendance had been more regular. He assured the members, however, that it was illness only which had kept him from fulfilling the duties devolving upon him, having been for four or five months confined to his house during the period of the meetings of the Association last session. Photography, he further stated, he made not only his business but as much of a pleasure as possible; and he felt that, by meeting together as they did that night, photographers would mutually gain much—nothing, in his opinion, being ever gained by secresy. Personally he would be only too happy to give any information if in his power to whoever desired it, and would esteem it a favour to be asked for it. Again he thanked the Association for the honour done him, and though feeling that others amongst them could fulfil the duties of President better, he would endeavour, at all times, to discharge the work devolving upon him to the satisfaction of all, and, meanwhile, wished the Association every success.

Urgent business having compelled Mr. Stuart to retire from the meeting, the chair was taken by Mr. J. P. White.

Mr. John Urie then read a paper entitled *Pictures from Life.* [See page 474.] The paper being of a general and sketchy character, and therefore not admitting of much discussion, the remarks that followed were of a limited nature, the members who spoke expressing, however, the great pleasure they had had in listening to Mr. Urie's interesting and amusing paper.

The Chairman said that to himself Mr. Urie's paper had recalled many similar experiences. He (Mr. Urie) had mentioned the names of many respected gentlemen, some of them since deceased, who had been first at photography. All that had been said about the late Mr. John Spencer he fully endorsed, he was so enthusiastic and so very obliging to any one who but asked his counsel and aid.

On the question being put how long it was since photography had been first practised in Glasgow as a profession, it was estimated by some of the members to be from thirty-two to thirty-four years ago, Mr. Dodd mentioning that he had noticed in a copy of the *Glasgow Herald*, for 1849, which he had lately seen, a number of persons had advertised themselves—one of the companies, evidently a travelling one, intimating that their stay would be for a short time only.

Several of the members also bore testimony to the kindly and obliging manners of the late Mr. Spencer; and, on the motion of the Secretary, a hearty vote of thanks was accorded to Mr. Urie for his enjoyable reminiscences.

A "new patent filtering material," the invention of Mr. Thomas Ross, Jun., late of St. George's Gallery, Glasgow, but now of Natal, Cape of Good Hope, was next exhibited by Mr. Campbell. It consisted of an ordinary round filter paper, to one side of which was caused to adhere, either by albumenous or other gummy substances or by mere pressure alone, a disc of gauze cloth or mosquito netting of the same size as the paper. The advantages to be secured by this union were, chiefly, non-liability to breakage and extra speed in filtering. Mr. Campbell mentioned that though the matter might seem a small thing to many, he had patented it in Great Britain, France, Germany, Belgium, and America, and that he had already had letters of recommendation from many professors of chemistry and others, two of which he read, in which the new filtering material was highly praised. He also stated he was prepared to pursue any one of the undernoted four courses regarding its manufacture:—First, to sell the right of manufacture to one party for the whole world; second, to a manufacturer of each different country; third, to all manufacturers of filter papers; or, fourth, failing any of these, he was quite prepared to push its manufacture himself and make it commercially. The invention was thought highly of by the members.

Mr. George Mason, however, pointed out that were Mr. Campbell to cause the cloth to be attached to the paper when in the pulpy state (as he said might be done) the cloth would, in all probability, sink into the paper and become incorporated with it, and the extra speed in filtering to be obtained by having the interstices of gauze free would be thus considerably decreased.

It was also thought by some of the members that the cementing substances to be used in causing the cloth to adhere to the paper would have a deleterious effect upon some of the chemicals during filtration; but Mr. Campbell pointed out that nothing would be used liable to do this, and that the cloth itself could easily be made as chemically pure as the finest Swedish white filtering-paper, which, he believed, was the purest sold.

The Secretary requested that a vote of thanks should be awarded to Mr. Campbell for having come thus early and described Mr. Ross's ingenious improvement, which he, personally, thought would come up to all the expectations claimed for it in the specification.

Mr. Robertson having next showed a varnishing apparatus, a vote of thanks to Mr. White, the chairman, brought the meeting to a close.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The usual monthly meeting of this Association was held on Thursday evening, the 27th ult., at the Free Library, William Brown-street,—the Rev. H. J. Palmer, President, in the chair.

The Secretary read several letters and showed some photographs that had been sent in from which to select a presentation print; but the Council considered it advisable to wait in order, if possible, to obtain a suitable negative from those belonging to members.

Mr. Edward Le Roberts and Mr. Edward S. Seddon were elected members of the Association.

Mr. J. H. T. Ellerbeck read a paper *On The Use of the Actinometer with Dry Plates.* [See page 471]. He (Mr. Ellerbeck) showed some specimens of simple actinometers, which could easily be made and carried in the waistcoat pocket.

Mr. W. H. Wilson, in moving a vote of thanks to Mr. Ellerbeck for his paper, stated that the use of an actinometer was an undoubted advantage. He (Mr. Wilson) had, on a former trip to the continent, found the light there so deceptive that he ought to have given exposures three times longer than he had done. On his last trip he took with him a slip of Durand's sensitised paper, and by noting the time it took to change to a certain tint he found he was able to judge of the time of the exposure of his plates accurately, and he had not under-exposed a single picture.

Mr. W. H. Kirkby said he had been trying different samples of sensitised papers, and showed prints from the same. He had tried the borax bath, only in using the acetate bath, which he preferred, he had been recommended to add two grains of washing soda to the pint, and found it an improvement in toning Durand's paper.

The President said that some of the plates he had coated for the members at their last meeting had been failures in their hands, while those of the same batch worked well with him. One, which he would pass round—an interior of the Walker Art Gallery—he thought was one of the best he had ever taken. He (the President) had tried an experiment, and found that he could coat twice as many plates with gelatine emulsion as he could with the same quantity of collodio-bromide emulsion.

A number of prints were exhibited by Messrs. Ellerbeck, Kirkby, Roper, Potter, and others.

Some charming prints were shown by the Secretary. They had been taken by Mr. Ellerslie Wallace, of Philadelphia, during a recent visit to this country, and attracted universal admiration.

After spending some time in examining a variety of things interesting to amateurs, which were exhibited by Mr. Ellerbeck, the meeting was adjourned until the 25th instant.

Correspondence.

CHROMOTYPE CARBON PRINTING.

To the Editors.

Gentlemen,—I shall not for a moment think of taking up your valuable space with a personal letter in reply to Mr. Witcomb's, printed in your last issue. It will be sufficient for me to say that no one can admire more than I do the steady perseverance with which he has battled against the difficulties of chromotype printing; and, spite of our non-agreement on matters theoretical, I readily admit that his work is excellent.

There is one point, however, that I will venture to insist upon, as I believe its importance—although insisted upon by many good authorities, yourselves amongst the number—is not sufficiently appreciated; and that is, the improvement that takes place in the working of pigmented tissue if it has been kept some little time after sensitising.

To go into absolute details, I would recommend the tissue to be excited in a bath consisting of *granulated* bichromate of potash, one ounce; water, twenty-five ounces. The temperature of this solution should never exceed sixty degrees. Immerse the tissue, with the usual precautions to avoid air-bubbles, both front and back. Allow it to remain three minutes, take it out, slowly drawing the face over a glass rod fixed at one end of the bath, and place the piece of limp tissue on a piece of bibulous board suspended from a cord, so that it forms an arch. It should take about eight or nine hours to dry perfectly in a room with a fireplace. If a fire has been burning during the day it may be allowed to die out, and there will be sufficient heat left in the chimney, &c., to secure the necessary change of air in the room to perfectly dry the tissue in the time named. When dry, I advise that the tissue be cut up into the sizes most convenient for the work that is to be done, and placed flat on tin trays just a shade larger than the cut pieces. These trays should be fitted with a piece of heavy lead or zinc, with a knob or handle in the middle, and which will just drop into the tray in the same manner as the old lead tobacco-boxes are fitted, where the inner stopper keeps down the tobacco and prevents a loss of moisture.

This method secures that the tissue will be pliable, convenient to work, and exposed to the air and light as *little* as possible. In this manner it may be kept without deterioration for many days. There will be a *slow* accession of sensibility, but will be so gradual that any printer who is at all up to his work will instinctively make allowance for it, and the advantages of softness and delicacy of half-tone in the print will be very manifest. In corroboration of this I will quote from an article by Mr. Foxlee, printed in your ALMANAC for this year, where he states that tissue "will be found to work much better after it has been kept a few days, so that it has become less soluble;" and it is exactly this *decrease* of solubility that enables the more delicate lights and shades to be retained when developed upon the collodion substratum.

In the same article there are some very good remarks upon the strength of the bath in relation to the varying density of negatives. Treating of prints that are flat and poor and lack vigour, Mr. Foxlee writes:—

> "This is caused by the tissue being over-sensitised for the kind of negative used, either by the bath being too strong or the tissue allowed to remain too long in it. There is as much care required in carbon as in silver printing with regard to this matter, and, by varying the strength of the bath or the time of immersion, poor and flat or bold and vigorous prints may be produced from the same negative. Thus a bath of five per cent. may be employed for negatives of a vigorous or hard kind; but such a bath would be quite unsuitable for those of a thin and delicate kind, now so general in many establishments. For these the bath should never exceed two and a-half or three per cent."

My own individual opinion is that a bath of four per cent. will answer for most negatives, and that with reasonable care in drying and storing the tissue as I have indicated the tissue itself will be in excellent condition forty-eight hours after its excitation, and remain in perfect working order for a week after that, the prints so produced being more harmonious, softer, and better in every way than those produced from tissue freshly sensitised.

With respect to the time that sensitive tissue will keep in good working order it has frequently fallen within my own experience to have it good for fourteen to twenty-one days after sensitising, and the operator here was printing on the 1st of October with tissue excited on the 21st of September. I am perfectly sure that sensitising a good batch of material at a time and working from it only after it has been kept a little will materially improve the quality of chromotype pictures, whilst it will certainly lessen the uncertainty and trouble in working.—I am, yours, &c., J. R. SAWYER.

Autotype Works, October 3, 1877.

◆

MOUNTING PRINTS.

To the EDITORS.

GENTLEMEN,—On going into the mounting-room of a friend the other day, I found him laying each picture *(cartes de visite)* face downwards, side by side in rows, on a large piece of glass until the glass was covered, then starching over the whole and mounting. To this followed the cleaning off the glass and laying down another lot, and so on.

Some young brother may be glad, as he was, to be told to put them all at once, one on the other in a pile, squeezing out, then starching the uppermost and lifting it off to mount, starch the next, and so on to the bottom. This is old to many, but may be new to some, as it was to my friend.

Another good help is to strain the mounting-starch through muslin. Some make it as thick as they can, and then just break it up with a spoon; but let them try the above. When it is cold and hard, or jelly-like, tip it into a muslin bag and force it through; it comes out like thick cream in consistency, and is laid on with *such* ease!—I am, yours, &c., W. H. WELLS.

High-street, Budleigh Salterton, October 1, 1877.

◆

THE LATE MR. FOX TALBOT.

To the EDITORS.

GENTLEMEN,—Without intending in the least to detract from the splendid honours your obituary notice so justly ascribed to the memory of the late Mr. W. H. Fox Talbot, I ask permission to record the substance of a conversation I had with the Rev. J. B. Reade about fifteen years ago, on which occasion he did me the honour to sit for the enclosed portrait. Mr. Reade then told me that he was the first to try to develope the photographic image by means of gallic acid, but Mr. Fox Talbot hit upon the happy idea of regulating the action of this reducing agent with acetic acid. Thus, to use Mr. Reade's own words, he "threw the ball and Mr. Fox Talbot caught it." Hence, according to this statement, originated the "great discovery" of 1840.—I am, yours, &c., W. HANSON.

Great George-street, Leeds, October 2, 1877.

[We thank Mr. Hanson for the portrait of Mr. Reade.—EDS].

◆

GELATINE EMULSION.

To the EDITORS.

GENTLEMEN, —The requirements of your correspondent, Mr. G. Morton, are so exceedingly modest that we are bound to admit he has made out his case; our method is of no import to him. Only one ounce at a time is a truly economical dose—indeed, too infinitesimal for further consideration in relation to the point in question. We desist, therefore; to continue would be to waste our own time and to try the patience of your readers.

Having once attacked what now appears to have been an obstacle almost as intangible as the air-drawn dagger in Macbeth, it behoves us to be less hasty in future lest we bring the controversy into ridicule.

As to the addition of organic matters to gelatine (a practice which Mr. G. Morton knows we condemn), it will be ample time for us to give any other reason than that they are unnecessary when he has given good and sufficient reasons in their favour.—We are, yours, &c.,

38, *Great Queen Street,* WRATTEN AND WAINWRIGHT.
Long Acre, October 2, 1877.

◆

"A CORRECTION."

To the EDITORS.

GENTLEMEN,—Of what refined piece of unflinching cruelty have you been guilty towards the poor editor of your contemporary in having compelled him, in his last number, to confess the roundabout appropriation, without acknowledgment, of one of your leading articles? There are some minds so unhappily constituted as to render it impossible for them to make the *amende honorable*, or to acknowledge an act of misconduct with decent grace. Of this class appears to be the editor in question, who "can simply explain that the cutting," so far from having been directly purloined by his own industrious and never-failing scissors, was really extracted by the sub-scissors of a friend, who clipped it from another journal which he does not deem it expedient to name, but which journal accredited it to yet another journal. The said editor (not as Mr. Scissors this time) cannot conclude his "simple explanation" without a characteristic display of his native modesty and good taste evinced in the following sentence, which may be left to the opinion of those who read it:—"We consider we paid him a high compliment in considering that the article was good enough to reproduce in our pages"!!!—I am, yours, &c., DON QUIXOTE.

[We, too, saw the "correction" in our contemporary, and were greatly amused by his painful endeavours to escape from the unfortunate position in which, through his affected ignorance of contemporary journalism, he had placed himself. In the interests of his readers we accord him full permission to utilise as many more of our articles as he pleases, but in doing so we shall in future expect him to make the requisite acknowledgment.—EDS.]

◆

RETOUCHING.

To the EDITORS.

GENTLEMEN,—Permit me, through the medium of your Journal, to lay before your readers a few practical remarks on the retouching of negatives, hoping, by so doing, I shall at least benefit a few of those photographers who believe retouching improves negatives, and also those who are of opinion that negatives are spoiled by such treatment.

In the first place, anybody who will take the trouble of perusing the advertisement pages of the Journal will perceive numerous advertisements in this form:—"Wanted, an assistant operator; must be able to retouch." It is not merely the small business photographer who requires an operator to retouch, but, in many cases, large firms who exhibit annually. When the operator is engaged usually the first thing he does is to retouch the negatives, of which there are generally a considerable batch, and at frequent times he is called upon to attend in the dark room or perform other duties included in the term "assistant."

Now, as a rule, most assistant operators know nothing of light and shade, and seek for nothing but to get rid of any freckles there may be in the negative, at the same time taking away indiscriminately anything that may lie in their course; and the result is a perfectly flat picture. When printed nothing is left but the hard lines of mouth, nose, &c. I have seen in the show-cases of well-known photographers prints from negatives that have been so treated, and the face rendered perfectly white by the aid of the assistant's pencil. In some studios they employ an artist to retouch; when there is a pressure of business the operator is put on also, and the consequence is that some customers get nice photographs while others get quite the reverse; they go away dissatisfied, get photographed somewhere else, and, of course, the first photographer gets a bad name.

If such be the improvement got by the retouching of negatives I would cordially agree with some of our best men who believe it to be a nuisance. Such treatment certainly does spoil the negative, and in some cases the customer also, while causing most of the re-sittings. But this is not retouching. It is the same in this as in other cases; the same name serves two purposes. There are very few who can really retouch, and these are certainly not assistant operators. All negatives require retouching more or less, and, when well done, are improved, and in some cases greatly so.

Professional retouchers, as a rule, have a great deal to contend against. I know a case of one who was finishing some negatives for a photographer. They were sent in and not approved of, on the ground that there was not sufficient work about them. They were sent again—this time covered with work—and were approved of, but the negatives were spoiled.

I venture to advise those photographers who either cannot afford to keep an artist engaged or whose business is not sufficiently large to require one, to allow the freckles to be taken out only, and not to permit the features to be interfered with. This should not be done by anybody but an artist. To ask an assistant to retouch is as bad as asking a printer to paint a miniature. Also allow me to advise photographers, when advertising, not to ask assistants to send samples of their work, because they invariably make use of whatever work they get hold of, no matter who has finished it. This accounts for so many being taken in.

And now a word to professional photographers. Put the work on only where it is wanted, and remember the least labour about the negative the better the effect. Attend to this, and you will avoid the swelled appearance so often the effect of over-working.—I am, yours, &c., CHAS. BRADSHAW.

September 24, 1877.

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THE AUTOTYPE PATENTS.

To the EDITORS.

GENTLEMEN,—I was rather amused at reading the remarks of the Autotype Company on the observations I thought it my duty to make in the Journal a week ago, in reply to their attack on the Glasgow Photographic Association, as I think the reply is more notable for what it omits or declines than even for unsupported assertion. Adroitly enough they decline being drawn into any controversy about the Company's patents, and, no doubt, for reasons they understand perfectly well.

I still contend that the process of Lambert is an infringement of Johnson's patent; but now they tell us that Lambert never had a claim for carbon printing, and this in the face of a compact made by the Company with him, enabling him to travel the country selling his process, the Autotype Company, at the same time, knowing that his licensees could not put it in practice without infringing their alleged rights. But this is not all; the country being pretty well exhausted, another arrangement is made with Lambert by buying his patents and making another good investment, and giving Lambert's licensees the use of the Autotype patents on the unselfish condition that they buy all their materials from the Company for seven years. And, again: why should they require to re-issue these licenses when they had already given Lambert the right to do so? Surely this is a crooked way of advancing the interests of photographic art, either at home or abroad.

As to the action of the Glasgow Photographic Association, I have again to repeat that they never interfered with the Company's patents, but certainly have been useful in preventing the renewal of the only patent worth holding in their possession, and will be instrumental in throwing open the whole process of double and single transfer, and also the free manufacture of tissue, thus removing a terrible incubus on the progress of art—the grim spectre of law proceedings and ruinous expense. I am told by the Company I cannot know much about carbon printing or I would have known that single transfer was discovered long ago. I would be "green," indeed, if I did not know that both single and double transfer were known and worked long before the date of any of their patents.

But will the Company inform us why, if Lambert has no claim to carbon printing, they charge the exorbitant sum of £30, and only £5 for all their own valuable rights? Echo answers—"why?" Or is it, as so plainly put by Messrs. Sharp Brothers, to get a discount of ten per cent. off all materials bought? Now, if this really be the case, would it not be better for the Autotype Company to make a clean breast of it, and cease to rival the chamelion in changing its hues?

But, in conclusion: what have the Autotype Company to give in return for the extra £25 for Lambert's patent? Is it the placing of a piece of paper on the back and front of a negative, or the printing of a vulgar marble border round a photograph, or the intensifying of chromotypes by permanganate of potash, as also the use of a printing-frame sold by themselves, and that none but a lunatic would think of using? It is a well-known fact that a patent may be renewed by the party holding the right showing that a sufficient return has not been made, and it has been generally understood, from the frequent changes in the holder of Swan's patent, that it has been a losing concern from the first; and I have no doubt that Mr. Swan could declare with a clear conscience that the amount that came to his share was small indeed. But I suspect there has been a stronger reason for not applying for a renewal of the patent than the bare want of remuneration. And then, at the expiring of the patent, what will the Company offer to the profession for their £5? Is it the waxing of a glass plate, or the transfer of a picture to a plate without the intervention of a cementing material, or the use of curd or soft soap in the manufacture of carbon tissue, as this is really about all claimed by the remainder of the Company's patents? In short, their letter strongly reminds me of the farewell scream of an obstructive and dying monopoly.—I am, yours, &c.,

83, *Jamaica-street, Glasgow, October* 2, 1877. JOHN URIE.

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BLUE AND YELLOW LIGHT.—Commenting on a letter by Dr. R. C. Croft on the subject of yellow light which appeared recently in the *Daily News*, Mr. Watson Smith, F.C.S., says that it shows several misconceptions with regard to the composition and qualities of light. The facts he mentions are perfectly in order, and his experience that yellow light (light deprived of its chemically-active constituents, the blue rays) is influential in abating the irritation and force of small-pox is undoubtedly valuable. But he seriously misses his way when he commences to make deductions, and to suggest precautions and remedies for sun-burns and inflamed and weak eyes. It is a pity, in fact, he did not try the effect of wearing yellow glass spectacles to mitigate the glare of sunlight before writing this letter. In justice to any of your lady readers at the seaside, to whom these suggestions appear to have been thrown out, will you allow me to explain briefly the composition and qualities of sunlight, and then our fair friends can judge for themselves if yellow veils or spectacles are better than blue or green ones. Common white light is not simple or elementary, but is a mixture of all the beautiful shades of colour observed on letting it pass through a common glass prism. In white light all these coloured rays are blended together, and the effect of the prism is to unravel them and lay them side by side, as in the opening of a many-coloured fan. Removing the prism is like closing the fan; the rays, so to speak, fall together again, and white light is produced. Now the peculiar band of coloured light produced by the prism is called the solar spectrum, and it commences with red at one end, and goes through orange, yellow, green, blue, indigo, to violet at the other end. Again: out of this spectrum flow the rays of heat, luminosity or light, and chemical activity or actinic rays. But these rays do not flow equally from all parts of the coloured strip of spectrum. From beyond the red end of the spectrum, and gradually diminishing to the blue, flow the heat rays, the maximum of heat proceeding out of the darkness beyond the red. The maximum of intensity of light is in the yellow and orange, but this falls off rapidly in the green, and still more in the blue. However, just in the blue, where the light is fading, the chemical activity commences to spring up, and goes on increasing as the depth of blue increases, till the maximum is attained in ths darkness beyond the violet. Now a body is coloured, because it absorbs all the other colours out of the white light which falls upon it, and rejects the one which appears to colour it, throwing it off in rays of coloured light. For example: a flower is blue because it absorbs from the mixture, white light, which falls upon it, all the red, orange, and yellow rays, and rejects or throws out the blue. In like manner a coloured glass absorbs from white light passing through it all rays of a different colour to itself, but these it lets freely pass. Thus blue glass allows only blue rays to pass, and absorbs and keeps back yellow, orange, and red rays, and consequently with them the intense light or glare (yellow) and the heat (red). Green glass is more mild; being a mixed colour (blue and yellow) it permits more light to pass than blue glass would, but the presence in it of the blue considerably mitigates the glare. Now yellow glass allows the most intense light-rays to pass, and with them a considerable amount of heat-rays also, and hence is just the worst medium that could be used to pass sunlight through in order to diminish glare, and would also be too ineffective as regards scorching by the sun. The blue rays are coolest and most free from light, and their chemical activity has no effect upon the eye, which is only constructed for the reception and utilisation of the light rays. On the other hand, when a part has been burnt or scorched, and the cuticle destroyed, an inflammation sets in, in which, probably oxidation of the tissue takes place, and it is possible in such case that the chemically-active rays might have some deleterious effect in favouring this action to some extent. But the important thing is to prevent the scorching and inflammation, and for this a blue medium, and not a yellow, is best.

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EXCHANGE COLUMN.

Wanted, a *carte-de-visite* lens, for which new portrait frames are offered.—Address, J. WILSON, 5, Keith-terrace, High-road, Lee, London, S.E.

I have a 10 × 8 glass bath in mahogany case with water-tight top, made by R. W. Thomas, for exchange. Wanted, weights and scales (glass pans) and 4¼ × 3¾ dry plates to total value of 15s.—Address, J. E. GUBBINS, Church Hill, Leamington.

ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

R. P. Yeo.—Received. Thanks. In our next.

W. H. W.—Thanks for your hint respecting Almanac. It shall have our best attention.

In a Fog.—While the principle of the drawing is correct, the proportions given are altogether wrong.

M. H.—We are quite unable to indicate the particular process employed in the printing of the circular.

A. G. R.—The subject is one which from its dark colour evidently requires a much longer exposure than you have given it.

A. A. Campbell Swinton.—By the washed emulsion process now getting into such general use both portraits and landscapes may be taken.

C. Brindley Beddoe.—An experienced printer to whom we have submitted your query says that you must not exceed two dozen *carte* prints.

Rev. Geo. Fisher.—Paint on the back of the negative with a mixture of burnt umber and ivory black, using for this purpose the oil pigments sold in tin tubes.

Amateur.—Silver cannot be properly deposited upon steel by the electro-metallurgic process. To do it the steel must first be coated with a very thin layer of pure iron, to which the silver will adhere most tenaciously.

Thomas Smith.—A diaphanoscope is merely an instrument, similar to a peep-show, for looking at photographs. If the photographs be transparent they must be illuminated from behind; but if of the ordinary kind—that is, silver prints on albumenised paper—they must be lighted from the front, the lights being so arranged as not to be visible to the spectator.

T. Bourke.—From your *carte* lens to a doublet of twelve inches focus is a long stride. The former is rather too short and the latter too long in focus. If we knew your method of producing enlargements we would be the better able to render assistance. In the meantime we advise you to try a lens whose focus is betweeh seven and eight inches, and you will then obtain a satisfactory enlargement.

P. S. C.—It is now too late to send in pictures for the Photographic Exhibition, and there is nothing in your case that would warrant a departure from the rule by which the day of admission was rigorously fixed. However, your pictures, if good, will keep till the exhibition of 1878. By paying more attention than you have done this year to announcements frequently made you will then have a chance of having your pictures admitted.

S. B.; J. M'George; Old Photo.; and other Querists.—We are unable to say when the annual technical meeting of the South London Photographic Society will take place. A meeting of the committee was to have been held last month to make arrangements; but when, a few days ago, we asked for information from one of the members of the committee, we ascertained that no meeting had then taken place. As soon as any decision has been arrived at we shall publish the particulars.

A. J. Roberts.—The relative degrees of strength of two or more different kinds of alcohol may be ascertained either by the hydrometer or the specific gravity bottle. We make use of both methods, but the latter gives the most accurate results where great nicety is required. Of course the scales employed, where great exactitude is imperative, must be very carefully made. For the requirements of the average photographer the hydrometer will answer the purpose quite well.

Mary B.—Salt and resinify the paper at one operation by immersing a good, plain sample in an alcoholic solution of benzoin containing chloride of cadmium. The following proportions will be found suitable:—

Alcohol	100 parts.
Benzoin	10 ,,
Chloride of cadmium	5 ,,

The paper dries quickly and keeps well. It is sensitised on a sixty-grain bath, and after printing is toned in the usual manner.

A Subscriber.—To enlarge a *carte* negative of three inches in length to eighteen inches by means of a lens the focus of which is nine inches, your camera would require to be about six and a-half feet in length; for the negative would require to be ten and a-half inches from the lens, while the enlarged image would be five feet three inches from the lens. But an equally good result might be secured by the employment of a lens having a much shorter focus—say six inches. In this case the whole length of the copying camera required would only be an inch over four feet.

G. Searl Woodward.—You are in error; patents are thoroughly sound in principle and are a great boon to the public. Just suppose, as a photographer, that inventions and discoveries were not protected, what would happen? If a professional photographer were to discover something new and good, and by which results of a nature superior to anything previously known could be obtained, would it not be for the public benefit that he divulge the whole particulars of his invention in return for being secured an interest in it for a limited period? Failing the obtaining of such small protection, would he be blameable were he to keep his discovery a secret and work it for his own benefit?

E. E. W.—Our correspondent inquires:—"Is there any method of staining a dry bromide film to prevent halation and blurring, and without impairing to any great extent its sensitiveness? What I want is a solution capable of being easily removed previous to development, and that will not crystallise on the film when dry. Backing the plate with red ochre I do not like; it is so messy. Besides, if great care be not taken, some of the backing is sure to get on the film."——In reply: various dyes have been tried for the purpose, but none of them have given general satisfaction. We have not experienced any mess or trouble connected with the use of a backing, nor would our correspondent if he adhered to the directions we recently published. "E. E. W." adds:—"I have read with great pleasure your articles on *Transparent Spots*, and although I cannot attribute *all* my spots to the cause of slow drying, still some of them may have been caused in that way. Strange to say, another gentleman who went the same tour as myself about six weeks after I returned has come home and found all his plates ruined from the same cause as mine, viz., spots. But since I have given the emulsion a more severe shaking previous to using I have seldom got a spot on a plate."

J. Johnston (Glasgow).—From Mr. Johnston we have received several excellent prints from negatives produced by his emulsion. In two of these the exposure given must have been very brief, if not almost "instantaneous."

Samuel B.—To etch a photograph of a line subject, such as an engraving, upon glass is a very simple matter. All that is necessary is to expose a sheet of gelatinised paper—ordinary carbon tissue will answer—previously made sensitive by means of bichromate of potash under the negative, and develope upon the plate of glass. When the glass picture is quite dry expose it for a few minutes to the fumes of fluoric acid. These are generated by placing pulverised fluor spar in a lead vessel and pouring upon it a little sulphuric acid. Apply a spirit lamp to the bottom of the lead vessel so as to gently warm the contents, when there will be an evolution of fluoric acid, to the fumes of which the plate must be exposed. All the portions not protected by the gelatine lines of the picture will be corroded, after which the gelatine may be removed, when the picture will appear in polished lines on a corroded ground.

T. R. T.—The pantascopic camera can be used with emulsion plates, dry or moist. We have recently tested this matter in the fullest possible manner; and, although the day was not unusually bright and a landscape lens having a somewhat small aperture was employed, we obtained sharp, good negatives on every occasion. By no other instrument with which we are acquainted is it possible to obtain a good photograph of a number of school-boys scattered about a field and playing at football. The only suggestion we have to make is the substitution of a portrait combination for the landscape lens attached to the camera, and the detachment of the clockwork by which it is rotated, for by no combination of wheel-work with a fly could such a degree of rapidity be obtained as would enable an "instantaneous" view of hundreds of boys scattered over a field to be secured. In such a case the camera must be rotated by hand.

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Photo-Bibliography.—At the Librarians' Conference, on Wednesday last, Mr. Henry Stevens read a paper on cataloguing by photo-bibliography. He said that every book, big and little, that is published, like every child that is born, should be registered, without inquiring into its merits or character. We are not Malthusian either in population or books. Who shall pronounce on the progeny of a mother or an author, or declare that this child or that book should not have been? Certainly not the registrar, or the cataloguer, or the librarian. A human soul that is once in existence, or a book that is once in print and published, you cannot well put out of existence. You may kill it, or cut it up in a review, or let it go astray and get lost, or neglect to buy it, but it exists, nevertheless, and, like sin or the lost book of Michael Servetus, is always liable to break out, and should, therefore, be provided for and against. If villainous, watch and impound it. The question of cataloguing our books is becoming a very serious one, and therefore, he asked attention for a few minutes to a word on the necessity and importance of printed catalogues of rare books and how to make them. For more than 400 years the press had teemed, and of late steamed, with books. The dead past lives again in print in our public and private libraries, where to a great extent are garnered up records of laws, manners, customs, history, literature, science and art—the intellectual accumulations of ourselves and our predecessors. Whatever we decide to do with our own mental offspring, we are bound in honour to preserve and transmit the stores of intelligence and knowledge we have inherited. He proposed to photograph all title-pages of rare and important books, reducing them at the same time to one-ninth of their original size, and to give these photograms to the printer. The printer would then compose from the photogram in readable type a copy of the title-page. The photogram itself would be pasted beside the printed text. The whole would form a card for a card-catalogue. The titles might be kept separate or be mixed with the slip catalogues of any library.—*Times.*

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METEOROLOGICAL REPORT.

Observations taken at 406, Strand, by J. H. Steward, Optician

For the Weeks ending October 3, 1877.

These Observations are Taken at 8.30 a.m.

Sept.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks
20	29·83	W	52	54	54	51	Cloudy
21	29·80	N	44	47	57	40	Fine
22	29·95	NE	45	48	57	41	Fine
24	30·07	N	48	53	58	45	Cloudy
25	30·28	NW	42	45	57	39	Cloudy
26	30·28	NW	49	51	—	42	Cloudy
27	30·43	W	46	46	60	43	Foggy
28	30·34	E	48	51	62	44	Foggy
29	30·26	E	46	47	64	43	Foggy
Oct.							
1	30·19	NE	49	51	62	46	Foggy
2	30·09	NE	46	47	59	41	Foggy
3	30·01	N W	41	43	—	39	Foggy

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 910. Vol. XXIV.—OCTOBER 12, 1877.

THE PHOTOGRAPHIC EXHIBITION.

This year's exhibition was, as usual, inaugurated by a *soirée* of the members and their friends on Tuesday evening last, the visitors having been received by Mr. James Glaisher, F.R.S., President, and by the other officials. There was a large attendance, several ladies gracing the meeting by their presence.

After entering the hall the first impression received is one of regret at the idea of such a fine collection of photographs having to be scattered in the course of a month, that being the whole period during which the exhibition is to remain open. A stroll round the gallery suffices to establish the fact that in the variety and general excellence of the works displayed the exhibition of 1877 is not only not inferior, but is in several respects superior, to most of those of preceding years. There is good taste displayed in the arrangement of the pictures, and no visitor will grudge a just meed of praise to those by whom the hanging has been effected.

From the large addition to the usual list of exhibitors we must believe that the offer of medals for the best productions in certain classes of pictures has had a beneficial effect. Out of a list of one hundred and thirty exhibitors it would be invidious to mention the names of any in a specially-laudatory sense; but we mention that of Mr. Bedford as being conspicuous by its absence from the catalogue—a fact that must be regretted. Among the foreign artists represented are D. van Monckhoven, André and Merieux, Jean Baptiste Feilner, F. Gutekunst, C. Klary, B. Mischewski, Carlos Relvas, Lafayette Seavey, Schulz and Suck, Stillfried and Andersen, and H. Wilhelm.

On the tables are displayed several volumes of works executed by the Autotype Company, among which are *facsimiles* of ancient manuscripts; a large collection of lantern transparencies by York, Woodbury, England, and Thompson; Prince's patent kaleidoscopic album; a similar album, graphoscope, cameras and changing-box by Hare; an album filled with Boissonnas' portraits of children and other groups; a newly-invented camera by Mr. Woodbury; and a collection of the photographs taken during the Arctic Expedition under Sir G. Nares, lent for exhibition by the Lords of the Admiralty.

Our readers have heard more than once of the large panoramic view of the Centennial Exhibition Grounds and Building, Philadelphia, taken by Mr. F. Gutekunst, of that city, and a copy of which was recently presented to the Queen. This famous picture, which is printed from seven negatives upon one sheet of paper, may be seen directly over the entrance door of the gallery. In close proximity is seen a large frame containing nine choice views in Ireland by Mr. Payne Jennings, who contributes several other pictures to which reference will be made subsequently.

Glancing round the room the eye is arrested by one or two enlargements of great dimensions by the Autotype Company—notably one of *Windsor Castle*, from a negative by Mr. J. R. Sawyer; by some enlargements from microscopical objects, by Mr. Viles; by large portraits taken "directly," by Mr. Bernard Mischewski; and by Mr. H. P. Robinson's large composition picture, *After the Day's Work is Done.* The lover of floriculture finds in the beautifully-grouped and skilfully-photographed pictures of flowers by Mrs. S. G. Payne, of Aylesbury, all that can be expected or desired in pictures in monochrome. Children still find in Mr. R. Faulkner and M. Boissonnas artists by whom are charmingly caught and perpetuated "the cherub smile of innocence and health;" while the "carbonomaniac" sees in some examples of combination printing from three negatives, by Mr. Higginson, the realisation of his desires.

If one seek for anything specially attractive in burnt-in or vitrifiable photography from nature he will look in vain, the various artistic representatives of this class of work on the table being of a character unlikely to prove generally acceptable. This is the weakest point in this otherwise comprehensive pictorial collection,

There is one feature in which the present exhibition differs from previous similar displays, namely, the great number of pictures from dry-plate negatives. To the special features of these works we shall refer in future articles; the fact itself is most noticeable.

We are pleased to see a fine collection of portraits, landscapes, and scenes in Japan, by Stillfried and Andersen (No. 14 *et seq),* and connoisseurs in feminine beauty will not be slow to recognise the personal attractions delineated in No. 22 of that series, *Two Young Ladies.*

To ascertain what can be done with dry plates in the hands of a capable artist the visitor has only to examine a series of Swiss views by Mr. England (Nos. 26-34). If we assume that some foreign views, by Mr. Stephen Thompson, which are hanging almost in juxtaposition—*e.g.*, Nos. 25 and 42—were taken by the wet collodion process, as was said in our hearing, we would ask—Who would not, in a good and reliable dry process, seek relief from the "dirty" skies and black spots with which the latter class of pictures prove to be sometimes attended when a bath is employed, or other chemicals used which appear to get out of order at the wrong time. The effect of pointing the camera upwards without making use of the counteracting agency of a swing-back to prevent the convergence of the marginal perpendicular lines is forcibly shown in the first of one of the pair of pictures in the frame No. 25. So far as we have yet noticed, the instance recorded is the only one in the exhibition showing the defect in question.

Several weeks since we drew attention to the merits of some solar camera carbon enlargements executed by Dr. Monchoven; of these there are no fewer than five now exhibited. We advise all visitors to examine these works carefully, the exposures given having been only a few minutes.

For perfection of rendering, a series of views by Mr. Frank Howard are unsurpassed. The seven pictures represented by Nos. 61-2-3 are remarkable for their delicacy and the excellence of the composition. Mr. Howard, we may hint, is President of the Amateur Field Club—a private society of gentlemen, including several of the foremost amateurs in this country. We mention this for the purpose of observing that the charming pictures contributed by this gentleman, as well as several others exhibited by various members of the club, have been taken during the monthly field meetings of the members. We recommend these views to the careful attention of landscapists.

We shall resume our notice next week; meanwhile, we follow our usual course, and give in another page the only two articles on the Exhibition which have yet appeared in the London daily papers.

MOVABLE LIGHT SCREENS.

In our last issue we dwelt upon the various methods of obscuring light by means of permanent alterations of the surface of the glass, and, the subject being one of considerable practical importance, we now return to another phase of it, agreeably with our promise.

There are very few studios constructed in which at some period or other of the day, during the summer months if at no other time, direct sunlight does not make its entry in such a way as to give rise to considerable trouble. Thus, one built so that the sitter requires to face the north gets the afternoon sun strongly shining on his left side; in those built east and west, where the sitter usually faces the east, the morning and midday sun pours down upon the sitter on the side to his right. In the latter case a permanent obscuring of the glass to a slight degree would not be productive of harm, and it could be combined with movable screens; but in the former it would not be at all advisable, seeing that in the winter months a considerable amount of light, at a time when every second is of advantage, would be kept out of the studio without the slightest corresponding advantage, and hence a means of obscuring light at a moment's notice is desirable. We need not catalogue the hundred-and-one cases that will present themselves to the mind of every practical man; but we may more particularly call attention to the fog-like appearance that sunlight, even after passing through ground glass, will inevitably produce when it passes athwart the field of view. This effect is not always noticed, and, indeed, is frequently unnoticed where the rays come in at an early or a late hour of the day, when the rendering luminous of the motes and floating particles is less conspicuous to the eye.

The means of obscuration are necessarily confined to various kinds of paper and of cloth, used in different manners according to circumstances; though we must not omit to note that in many studios it is customary to cover the windows with whiting during the summer months, and then rub it off as winter approaches. This, however, we cannot avoid thinking is a very unscientific way of managing things, as the light in all studios should be under such control as would enaable it to be varied in an instant.

The commonest form of paper used is the "silver" or "tissue" paper that can be bought at any stationer's shop. It can be put in place by pasting at the edges, or by pinning it up with drawing-pins to the window bars; in the former way it is scarcely to be brought under the head of "movable" screens, and even with the use of pins it is rather laborious work to cover or uncover a large space of window or skylight. The labour may be considerably lessened by purchasing the material in the piece—that is, in rolls of a certain length—instead of the sheets in which it is usually supplied.

In some places it is customary to use "tracing" paper—a material of most translucent texture, and free from those minute holes so common in tissue paper, and which, in the aggregate, allow a large proportion of direct sunlight to pass through. There are, however, so many grave objections to its use that we could not for a moment recommend its adoption. The translucent appearance given to this material is owing to a varnish used in its preparation, which, in consequence (no matter what its constituents may be) is certain to turn yellow in a very little time after exposure to air and light, and will then "slow" the light in the studio to a very appreciable extent. There is a non-varnished tracing paper in the market of even texture, free from the peculiar minute aperture noted, and very strong; but it is rather expensive. It forms a capital material with which to cover the backs of negatives to stump upon, in stopping out or lightening various portions of the image.

Of all this class of material, however, the most useful and nearest to perfection is *tracing cloth*—a beautifully-even, translucent material. very strong, and possessing such an extreme gloss that accumulations of dust, &c., can be wiped off it with ease. It is prepared, we believe, by passing it between heated rollers after it has been sized with something like rice starch. If interposed in one or two thicknesses—one generally sufficing—between a sitter and the full blaze of the midday sun it alters the hard lighting into a beautifully soft, mellow illumination, with an effect that no other material at all approaches. We have seen it applied in endless varieties of modes and in every possible position with excellent effect, and wherever we have had an opportunity ourselves of pointing out its usefulness and excellencies we have always found it to be considered a necessary part of studio fittings. No doubt it is no new material to many of our readers, but we practically know that there are also many who have never even seen it. It is to be purchased in rolls of twenty-four yards of various widths, the wider pieces being, however, proportionally very much dearer. Care should be taken when buying it to ask for the kind glazed on both sides, as there is a quality made (which, indeed, is in most demand) for draughtsmen which has one side dull so as to take water colour easily.

We have seen an excellent adaptation of this material in a studio with a south light, which rendered it possible to be used even in early morning without any overpowering glare. The roof was glazed with ground glass, and across it were stretched two pairs of strong wires, and on these were suspended two slight wooden frameworks, upon which were strained pieces of this tracing cloth. When the sun was out these frameworks were drawn right across the skylight, when they softened and mellowed the light most pleasantly, and when they were no longer needed a slight push with a rod sent them easily and quickly over one another to the end furthest from the sitter, and thus left the glass free from obstruction during duller light.

There now remains to be noticed obscuring media of a still more portable character, which may be included under the title of blinds proper. These require little recognition here beyond mention. Their name is legion; they are made in every variety of shape and material, and of all thicknesses.

The material we have found to give most general satisfaction, and the one in most common use, is the fabric known at drapers' establishments under the name of "jaconet." It is comparatively inexpensive, easily made up, and can always be washed when required. There is, however, a great objection to the employment of all woven goods of this description—they gather and hold dirt so closely. A blind of this material requires changing or washing at least every two months, and that in the busy season, at a time when the operator's whole exertions are given to manipulation, is too serious a drawback to be borne with impunity. It usually happens when blinds made of this fabric are employed they are allowed to remain for twelve months, and are only removed when the leakage, which seems to be chronic in most studios, begins to play such fantastic vagaries upon the original purity of whiteness of the fabric, so that for very shame they are removed or renovated.

We can but repeat our suggestion to make use of the tracing cloth whenever the chance offers, and we feel sure that anyone who once pins a piece up in his studio will never be without a good-sized roll at which to "cut and come again."

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One of the greatest of the minor "pests" in photography is the blistering of albumenised paper, which frequently occurs when the prints are removed from the fixing bath into water. Many suggestions have been made as to the cause of this annoyance, but it seems clear that it arises from some peculiarity in the sizing of the paper which causes the albumen surface to cling but slightly to it; so that upon removing a print saturated with hypo. solution suddenly into clean water the rapid diffusion of the salt overcomes the attachment of the albumen for the paper, and causes the blisters complained of. The usual remedy consists in removing the prints first into a weaker solution of hypo., so as to lessen the quantity of that salt contained in its pores, and afterwards into pure water, or to gradually dilute the solution by allowing a stream of water from the tap to mix gradually with it; but this is not always effective, as some samples of paper blister in spite of all precautions. Fortunately, the blisters very rarely prove actually detrimental to the finished picture, as, unless very large, they entirely disappear during drying. We have been using lately a new sample of paper which, though as near perfection as it is possible to attain in other respects, exhibits this defect to a very annoying extent. The annoyance arises from the great care necessary in handling the prints, for the blistered surface is very easily injured by the ordinary treatment dealt out to ints in washing, and also from the wrinkled, uneven state of the ied pictures, which greatly resemble pieces of leather that have assed through the fire. When once got rid of, by drying or otherise, the blisters do not reappear; hence we have found it useful, fter washing the prints rapidly in two or three changes of water, to ress them between blotting-paper, and, if there be only a few to perate upon, to hold them to the fire for a few seconds till the blisters isappear, or, if a large number, they may be laid out to partially dry, hen the same effect ensues. They are then put back in the washingough, and no further trouble need be feared.

SPOTS ON EMULSION PLATES: THEIR CAUSE AND CURE.

[A communication to the South London Photographic Society.]

Now that the emulsion process fairly ranks with the landscape photographer as one of the foremost processes of the day, I venture to bring it again before your notice. Some years since, at one of the meetings of this Society, I said that I thought the emulsion process would take the place of the nitrate of silver bath. At the time this was doubted, but I have not had any reason to alter my opinion on the matter; for, during the past season, I have only used the bath once, and that was because I had not any emulsion then ready. Formerly I contented myself by working with a slow emulsion which was very certain. I am now using a very rapid one of my own make, and I can say, without the slightest hesitation, that it is more rapid than the ordinary bath plate, everything being in good, fair, working order; so that I am now quite independent of the bath altogether, and see no reason why I should take to it again, especially for field work.

About the middle of the present year I had a large quantity of work on hand, and when I had to prepare the plates in large numbers I was troubled with spots. I had previously been quite free from them. Several had asked me if I had any spots, and my reply was always "no," until the time before stated. I was told that I was a lucky fellow. But my luck failed me at last, and then I set about to find the cause and the remedy, which I did, but not without a great deal of trouble and anxiety; and now that I am quite free from them I beg to offer the results of my investigations for the benefit of those so troubled.

In the last three issues of The British Journal of Photography, in articles by the Editors, there are several good suggestions as to the cause of a certain class of spot. In my experience I find three kinds of spots:—No. 1 is a transparent spot, with a small black speck in the centre; this kind of spot is not altogether more than about one-eighth of an inch in diameter. No. 2 is a transparent spot also, but without a nucleus (or black spot in the centre), and has a ring of wave-like markings; this kind of spot is sometimes as much as half-an-inch in diameter or more—a regular patch. No. 3 is quite the opposite to the foregoing, being quite opaque throughout, the largest seldom being more than an eighth of an inch in diameter; this kind of spot is more uncommon than the two former.

I will deal with spot No. 1 first. I think there is not a question as to the cause of this kind of spot, and that is dust settling on the plate during the evaporation of the solvents, ether and alcohol; and it is the kind of matter constituting this particle of dust that determines whether the resulting spot be transparent or opaque. Should the particle of dust be some inert substance, the result is only a pinhole; but should it be a retarding agent, such as a small particle of a bromide, iodide, or an acid substance, the essential part would be readily dissolved by both the ether and the alcohol, causing the parts round the substance so deposited to become insensitive to light, and originating the transparent spot, with the substance, whatever it may be, forming the nucleus. When the plate is nearly dry, before the dust falls on it, the resulting spot will be small, and perhaps not perfectly transparent throughout; but should any dust fall upon the plate when dry, no matter of what it is composed, it does not appear to injure the plate in the slightest degree. When preparing only a few plates (about a dozen) I used a cupboard; but when I had to prepare larger quantities at a time I used a large box as well, and the plates set to dry in this large box were the ones that had the class of spot I designate No. 1, and they only occurred when I closed the lid. If I allowed the plates to dry without closing the lid they were free from that class of spot; hence I have no doubt they were caused by dust on the inside of the lid of the box becoming detached and falling on the surface of the plates in the moist condition on closing, the plates being in the box film outwards; and I think in nine cases out of ten many would use a box (and close the lid) for the purpose. I cannot agree with the writer of one of the articles in The British Journal of Photography where he says that, by dust falling *into* the emulsion when poured out on the plate, it then, and only then, affects the film. My opinion is that anything falling into the emulsion—supposing it to be a restrainer or retarding agent—by virtue of the alcohol or ether, the active principle would become dissolved and be diffused throughout the whole of the compound, tending only to make it slower. On the other hand, supposing it to be a reducing agent, the small particles would be almost sure to be dissolved, and would do but very little harm (if any), and any substance that might be left behind would be of a sandy nature. To test this I have put all sorts of rubbish into the emulsion, and, after shaking it and letting it settle, have prepared plates that have worked as well as ever.

I now come to the class of spot I call No. 2. This has a totally different origin altogether from the preceding one, and will also occur in the closed box before mentioned, especially if the solvents used be of a weak nature. I have seen the question frequently asked—"Why do spots occur in washed emulsion plates and not with those prepared with an emulsion that has not been washed and dried and redissolved?" On a little consideration it is easily understood. The first named, known as washed emulsion, is poured over the plate and allowed to dry; that is, to allow the ether and alcohol to evaporate. Not so with the other kind. After the film has been washed and passed through the preservative and set to dry, only water has to evaporate. This kind of plate is generally free from spots; but, when using the washed emulsion, and the spirits have only to evaporate, matters are changed. It is a well-known fact that strong alcohol has a great affinity for water, and, if the atmosphere be damp, water is attracted from it, causing the plates to dry patchy; and there is not only the affinity of alcohol for moisture to be contended with, but also the chloride of silver contained in the emulsion, as all chlorides absorb moisture. It will also be remembered that, in the days of the collodio-chloride emulsion, spots used to be troublesome. I know they were so with me, and that may be the cause why a chloride cannot be successfully worked in a gelatine emulsion. When the collodio-emulsion plates are dried in a damp or humid atmosphere they attract the water in patches; for, if plates are watched, the last parts that become dry are circular spots. Those remain damp a long time, and that part of a plate that is a long time in drying seems to be the most insensitive. I had, to my regret, a batch of plates spoiled from having been prepared in a damp atmosphere in a butler's pantry just after it had been cleaned and washed up, and when there was no possible chance of dust. The last part of the spot to dry was, of course, the centre, and when the plates were developed the centre was the most transparent part. Some of these spots were quite half-an-inch in diameter. Of course in this case there was no nucleus.

The spot No. 3—the most uncommon—I suppose to be perhaps the dust of nitrate of silver or some alkaline agent. Should it be a dust of silver it makes its appearance as a black, opaque spot as soon as the ammonia is added to the developer; but, should it be an alkaline agent, a black spot appears as soon as the pyrogallic solution touches it, and that part of the film at once becomes reduced.

Having stated the cause of the spots of the different classes as they have occurred in my practice, I will now point out the remedy. It is best to use neither boxes, drying-boxes, or cupboards, and avoid a damp atmospheres if possible. In my work I am now perfectly free from spots, and I proceed in this manner:—After the glass is cleaned I edge the plate, in the usual manner, with india-rubber, and a flat, stiff, hog's-hair brush is passed over the plate to remove any dust. I find the best kind of brush for this purpose is the flat hog's-hair varnish brush, such as is used to varnish oil paintings; it is very suitable. After I have coated two or three I dry them by means of a kind of hot-water bottle, which gives a very steady heat. If too hot when the water is first put in a thickness or two of cardboard is put over it, which is removed as the temperature gets lower. By keeping the spirits evaporating moderately rapid there is no chance of spots of the kind of No. 2; after being once dry they are perfectly safe. Keep away the dust and spots Nos. 1 and 3 are out of the question. If the plates are made to dry by means of a current of air, that current of air will be sure to carry with it dust and spoil the plate. I quite agree with Mr. Woodbury when he says that plates are best dried by means of heat.

In conclusion: I may say that an emulsion properly made is not so liable to get out of order as the nitrate bath. I have put all sorts of things in emulsion, by way of experiment, that would quite ruin the bath, but it has not injured the emulsion in the slightest. At one time I thought spots had a different origin to what I do now. Many say that if the emulsion be not allowed sufficient time to settle spots occur. To try the effect I have prepared plates directly

I have shaken it up and dried them off by heat without any of the kind of spots before named. The only description of spot that can then make its appearance is a kind of sandy one. I trust what I have said may be the means of putting the emulsion process on a better footing; for I think there is nothing more provoking than to have what would have been a good negative ruined by a collection of spots.

W. Brooks.

GELATINO-BROMIDE.

A few weeks since I sent you a formula for the above, which you honoured with a place in The British Journal of Photography. Perhaps it would be as well to say why sugar or treacle was added to the emulsion, which with your permission I will now do.

When I first began to try this process three or four years ago many of the plates, when developed, were thin and feeble. I thought if I could make the gelatine more penetrable to the developer the emulsion might be improved. This gave the first idea of adding sugar. It was tried, and found to have the desired effect. The plates were brighter and clearer and better in every respect, and any density could be got without silver intensifying. There is much more latitude in the exposure, which with the plain gelatine plates I found must be hit to a nicety. Treacle in the form of golden syrup was subsequently tried and found rather better than sugar. These organified plates also keep very well. I have had them in the dark slides six months before exposing them, and on development they were just as good as freshly-prepared plates. Most of the sugar or treacle dissolves out in the washing, but it has had some effect on the emulsion, which effect remains to influence the result. I may add that it does not do so well to add the organifier after washing.

When beer was recommended I tried that, but did not find it any better, if so good. Coffee had a curious effect. When the emulsion containing coffee was poured on the plate and drained off the emulsion ran into holes, as if there had been hundreds of spots of grease on the plates.

If the emulsion be forced by heat in the way described by Mr. Aston, with a small portion of the gelatine at first, the time of making may be greatly curtailed and high sensitiveness attained. The same principle is equally applicable when it is preferred to leave the emulsion to itself for five or six hours before a fire; much greater sensitiveness may be attained in this way than by having the whole body of the gelatine in the emulsion at first.

Plain gelatine plates have often since been tried alongside of the organified ones, but always with the same result—the plain plates being much inferior to the others. I do not presume to say that this must be the case in the hands of all other workers; I only give my own experience, which, perhaps, may be of use to some.

G. Morton.

NOTES ON PASSING EVENTS.*

By a Peripatetic Photographer.

"I, too," I said to myself, "will be an inventor of a quick-acting shutter, inasmuch as this is on the *tapis* at present." Accordingly I fixed in front of my sharp-shooting camera—with which I photograph the sweet smiles of babies, the crash of the thunder as displayed in the startled face of the emotional listener, or the crested billow as it is being hurled against the rock—a pair of uprights *à la* guillotine, between which drops a shutter having in it a horizontal slot the width of the objective. If this be dropped in front of the lens the plate will receive an exposure equal to the time taken by the aperture of the shutter in passing before the objective. As it stands to reason that this will allow of an exceedingly rapid exposure being given, I adopted it as a means to secure my name being handed down to posterity as one of the great inventors of this prolific nineteenth century. But I recollected having read, several years ago, in the "Answers to Correspondents" in your Journal a bit of advice to inventors, to the effect that they should consult some one of more experience than themselves as to the novelty of any "fad" they intended launching forth to the public. I followed the advice, and, to my intense disgust, am informed that a dropping-shutter is no new thing, for it appears that eighteen or twenty years ago it formed the subject of a communication to a society, since defunct, in the Scottish capital. If it be really true that anyone brought such a shutter before the notice of the Photographic Society of Scotland, all I have got to say is that he ought not to have done so, but to have left its invention open to all comers, when I would have claimed it. But this is always the way. No sooner is a good thing suggested by its fond parent, who complacently strokes his beard in anticipation of coming honours, than up starts one of those "kill-joys" who say "turn to volume so and so of The British Journal of Photography, and at page 800 you will find that you have been forestalled." In sober seriousness this priority of invention is a nuisance. If things go on in this way there will be nothing left to invent. "Bother them ancients!"

Far be it from me to be hypercritical in matters æsthetic; but is Mr. Wake *quite* right in saying that the number or variety of shadows in a face are limited to two, viz., cast shadows and shadows caused by the rounding or retreating of the surfaces from the light? He would not have confined himself to the dual number had he been with me in the studio of a photographer, when the principal received intimation of the fact that, by the unexpected absconding of a "friend" for whom he had become surety, the sum of four hundred pounds would have to be paid the following morning. How are we to designate the shadow that fell upon the face of that gentleman? Verily there are shadows *and* shadows.

I feel somewhat tickled when I hear complaints made with respect to the varnishing of negatives, for though I was also at one time sorely troubled I now dwell in Arcadia. I *now* never so much as dream of warming a negative previous to applying the varnish, which having been poured upon a cold plate dries bright and hard; and not merely hard, but also tough. It is strange that the makers of varnish, in looking over substances that are soluble in strong alcohol, should not have discovered that there are more resins than their small philosophy has allowed them to dream of. Yet so it is. When I am varnishing negatives I abstain from heating them, but simply apply the varnish, which flows over them with an oleaginous smoothness, and allow it to drip off at one corner. It dries with a bright surface in a couple of minutes; but I always prefer to expose the varnished plates to a smart heat to drive off the last vestiges of alcohol. Are manufacturers of photographic varnish too proud to send to Japan for their resins, and for information as to the proper method of using them?

The experience of your correspondent who writes the articles entitled *Photography at the War* (and in which articles I find no mention made of his being at the seat of war) differs from that of others who have been in Constantinople with a camera. When I was there no difficulty was experienced in getting any number of the deformed multitudes of that great city to sit or stand for their portraits. With me the difficulty lay in preventing them from getting into the field of view. It is my honest conviction—the experience of Mr. Pocock notwithstanding—that an investment of sixpence in the small coins of the Moslem realm would secure the attendance of the whole tribe of malformed Islamites in any place in which I liked to plant my camera in Constantinople. The deference paid to the canine tribe of nomads in that city is most wonderful. If one of these brutes happen to fall asleep directly in the route of a tram car, as they not unfrequently do, the driver, instead of briskly applying his whip to the "obstructive" stops the car, and going up to the lazy quadruped almost entreats him to "move on" or to one side. Such deference to dogs I never saw elsewhere. The novel pictures of street life that might be picked up in the capital of Turkey by an enterprising photographer are truly legion.

Noting what has been said by way of description of *Prince's Patent Kaleidoscope Album*—which is an undoubtedly good thing—I may be permitted to inquire in what respect it essentially differs from an album for a similar purpose that was described, with an accompanying drawing, in the *Scientific American* seven years ago; and further to inquire if the publication of the latter-mentioned instrument does not throw the invention open to readers in every country in which publication has been made. It is quite possible that the two inventions may be different, although they profess to be for a similar purpose; anyhow, a confessed want is supplied by the introduction of an album of the kind alluded to, whether it be of English or American origin.

Before this falls under the notice of the reader the exhibition of the Photographic Society of Great Britain will be open to the public. May every success attend it! and may the influence of such a competitive exhibition be felt many years hence!

Observing that a correspondent has been making an inquiry concerning nitrate of mercury as a photographic agent, I beg to state that Sir John Herschel found that when paper was washed over with this salt it became slowly and feebly blackened when exposed to sunshine. Its action was rendered more apparent when used as a reducing agent in connection with ammonio-citrate of iron. Combined with iodide of iron it also conferred great sensitiveness. If paper be washed over with the iodide, followed when dry by a wash of nitrate of mercury, a very sensitive surface is the result. Although uch paper is rapidly darkened in sunshine, it recovers its original olour (a light yellow) in the course of a few hours. There are several urious reactions which belong to the mercuric salts, and it would e a boon to science if they were thoroughly investigated.

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* Concluded from page 464.

HOW TO GET FORTY-EIGHT *CARTES* OUT OF A SHEET OF PAPER.

N your ALMANAC for 1877, and at page 123, I find an article entitled *Iow to Get Forty-two Cartes out of a Sheet of Paper.* Now as I nanage to obtain forty-eight *cartes* from one sheet, and with far less rouble than that indicated for the lesser number, I beg to describe he method I pursue.

Lay the sheet before you, having its length from right to left. Then fold it breadth-ways twice. It will now be a fold of four hicknesses, the length of the whole sheet and a quarter of the riginal breadth. Next find one-third of the length of the sheet as t lies folded before you, and, making a mark, double it up in the lirection of its length three times. It will be found that it is now wrapped up into an oblong, 7½ × 4¼ inches. With a paper knife cut the sheet, whilst thus folded, as you would the leaves of a book; and each separate piece of 7½ × 4¼ inches will make four *cartes* by simply folding through the centre each way, and again cutting as before.

Having folded one sheet you have the measure of one-third the length thereof for any number afterwards; so really there is no setting out at all, merely folding away as fast as you like.

I get nine pieces for printing from 6 × 8 plates by folding the sheet into three each way. They are a trifle short—a sixth of an inch. They come out 7⅜ × 5½ inches.

For stereos. cut a strip off the end of the sheet the width of one stereo.—say 2⅞ inches. This strip will make two stereos. 6½ inches long and an inch or two of the end to waste. Fold the sheet as left into three each way, as above, and cut. Each piece will then make two stereos. by folding and cutting, so as to halve the breadth. This plan will give twenty stereos.; and the best of the whole of the plans is the economy, ease, and speed by which the paper can be manipulated.

W. H. WELLS.

THE ART OF PAINTING ON THE PHOTOGRAPHIC IMAGE.

No. VII.

THE background may next demand attention—that is, in order of description, and not of painting; for at least a wash ought to have been got over it along with the face and drapery, so as to "keep the picture together," as artists call it, because then you can judge so much better of what you are doing.

The tone of a background may make a great difference in the treatment of a face. For miniatures a great variety of backgrounds are used, from maroon to cool grey or green. A good, generally useful, mixture for a miniature is a grey composed of French ultramarine and sepia, with gum, shaded off to deep brown or pure sepia at the lower corners over the shoulders, or even a little burnt sienna. If a maroon be desired sepia and lake should be used for the light parts, with Vandyke and lake for the deeper parts.

A very pretty effect is got by washing in with two colours and stippling with a third; for instance, washing in with burnt sienna and ivory black, and stippling with Prussian blue. A greenish background may be got with emerald green and a little black, or French ultramarine. As a rule the light part of the background should be cool and the deeper parts warm.

The background should be washed in as evenly as possible and then stippled up, or, it may be, evened up by a little stippling, and then cross-hatched. It is also a good rule to bring the background dark against the light side of the face, and light against the dark side of the face. Although I am aware that there are great authorities for an exactly contrary treatment, yet this is the easiest and generally most effective.

I do not think it well, nor is it usual, to introduce objects into backgrounds of small pictures; but anything over (say) 10 × 8 may have a place, if really desirable and of any use. A panel or corner of a room may be introduced. If the former, do not let it be too hard or distinct, nor painfully and distinctly made out through its entire length; if the latter (a corner), remember the way the light comes. Also note that the corner of a room—the *extreme* corner—is never dark; for if you look at that part of a room you will find there is a line of light running down it—probably reflected light—from the two sides. A curtain is a favourite device; but how rarely do you see it well done! It should not be too straight, and any corners should be so arranged as not to *repeat* the outlines of the figure. But wherever there is a prominence in the figure one should be opposed to it in the curtain; and yet this must not be done too mechanically or obviously, As to colour: if you want to force a pale complexion, of course green is the thing; or, on the contrary, if you wish to cool a red one, oppose a red curtain to it.

There is another rule recognised by most artists, and that is that if there be a small piece of very bright colour anywhere in a picture there should be something introduced somewhere to "repeat it," as it is called—generally in a slightly lower key of colour. The latter is sometimes of use in another way. Suppose you are obliged—as sometimes happens, especially in portraits—to introduce something objectionable in colour, either from its being in a wrong place from a pictorial point of view, or from its being too bright and staring, you may paint it rather quieter than you otherwise would if you repeat the same colour somewhere else much lower in tone. It makes the other look brighter, without its being so obtrusive.

JOSEHH WAKE.

NOTES FROM THE NORTH.

I SUPPOSE every photographer tries to do his very best in the getting up of specimens for his own show-cases, and so long as the work is *bonâ fide* his own, or that of his assistants, there is, as a rule, nothing to be said against it, although in too many cases the stock may fall far short of the sample. If, however, we hold that the object of exhibiting specimens is not only to show the style and quality of the work of the exhibitor, but also to convey to the public an idea of what it will get for its money, we are fairly entitled to expect that they shall be such as will not in any degree mislead the intending sitters. Such reflections occurred to me while in Glasgow a few days ago, where my attention was attracted, in more than one locality, to several cases of very pretty *carte-de-visite* pictures possessing a purity, brilliancy, depth, and general beauty not often seen. The cases—or at least one of them—contained an intimation that the pictures were permanent, and that "*cartes-de-visite*" were so much per dozen—the "so much" being a very modest figure. The idea at once suggested itself that surely the man who could produce such excellent work deserved better prices, as the natural inference was, of course, that they referred to the pictures exhibited. A closer inspection, however, revealed the fact that the pictures were "*carte*" only in size, and that in reality they were prints either developed on, or transferred to, opal glass. Now while I should not like to take the responsibility of saying that there is anything wrong in this, I cannot help thinking that many who may be attracted by the beauty of the specimens, and who may sit in expectation of getting something similar, will be wofully disappointed when the ordinary cards are delivered, unless the necessary explanation has been made.

Messrs. Wratten and Wainwright have discovered that the only way to attract the attention of photographers even to a good thing is by frequent iteration and reiteration, and having hit on something really good are doing the right thing in seizing on every opportunity of bringing it into notice. I wish them all success, and as a proof of the justice of their estimation of my desire to be accurate in everything that I write, I have taken their hint to look again at the alcoholic question. I am well aware that trade practices differ in different localties, but think the following may be taken as a fair statement of the general facts in connection with spirit:—

Perfectly pure anhydrous alcohol, $C_2 H_6 O$, is not really a commercial article. What we know under that name is simply a mixture of alcohol and water, and although, by many, the title is used as if synonymous with spirit of wine or rectified spirit, it would be more convenient and less misleading to confine it to the article as produced by the manufacturing chemist. In the trade, so far as I am acquainted with it, there are four varieties of spirit recognised, namely, plain spirit, rectified spirit, methylated spirit, and absolute alcohol. The excise authorities, who are very jealous of this department of manufacture, start with plain spirit having a s. g. of ·920, and strengths above or below this are known as over or under proof. When, however, the strength reaches 43 over proof, or s. g. ·859, it is then recognised as belonging to the second class, or rectified spirit, and may be occasionally met with of any strength from this up to 70 per cent. over proof, or of s. g. ·809. But, practically, the requirements of trade are met at or near 60 over proof; and, from over twenty years' experience as a tolerably large consumer, I know that an order sent to the rectifier in Scotland for "rectified spirit" or "spirit of wine" will be executed at 62 over proof, and in England at 60 over proof, or of s. g. ·825 and ·829 respectively.

To spirit of wine as thus defined the rectifier is permitted, but under very close supervision, to add the requisite quantity of a suitably nasty quality of naphtha, and then send it into the market, duty free, as *methylated spirit;* but the authorities of the excise have, or had, very decided objections to further manipulation with that commodity, and therefore nothing methylated could legitimately be got stronger than rectified spirit. To the photographer this is no hardship, as spirit of a s.g. of ·825 is strong enough for all his requirements, and every penny paid beyond (say) twenty-two shillings per gallon for pure and five shillings and sixpence for methylated spirit is just so much thrown away. The so-called absolute alcohol of the chemist, prepared by the action of lime on rectified spirit and subsequent distillation, should really have a s.g. of ·796; but its affinity for water is such that, unless well secured, it gradually gets higher. This, however, is of little interest to the photographer, although I may say that a sample which has been in my laboratory for over two years proved on careful examination to be ·798.

As I have not for several years been commercially connected with alcohol I was anxious to see whether any change had occurred in the practice of the trade, and during the past week collected seven samples from as many different sources—some in Edinburgh and some in Glasgow—and, after carefully adjusting the temperature to 60° F., ascertained, as accurately as the balance would show, that they stood as follows:—Nos. 1, 2, and 3 pure, were respectively ·825, ·828, and ·833; but the latter was drawn from a cask about half full and imperfectly bunged. Nos. 4, 5, 6, and 7 were methylated, and stood respectively ·823, ·825, ·825, and ·827.

Having a strong belief that gelatine will very soon supersede collodion for all emulsion work, I should be truly glad if Messrs. Wratten and Wainwright would help the many who, like myself, cannot get density without the addition of organic matter other than gelatine. I have followed their advice step by step, yet, while I get a beautiful, faint image, it positively refuses to take anything like sufficient intensity, and becomes hopelessly fogged when an attempt to force it is made. The addition of beer, as recommended by the Rev. H. J. Palmer, is a decided improvement, and so also are a number of other substances of a like nature, but they still fall far short of the results got on plates prepared according to other methods. JOHN NICOL, Ph.D.

PICTURES FROM LIFE.[*]

FROM THE SCRAP BOOK OF A PHOTOGRAPHER.

WE all know how enormously the chances of individual recognition have been multiplied by our art, and doubtless absconding criminals and swindlers have no reason to rejoice in the invention of the camera. I may mention a case which occurred with myself, as an instance of the good service the photographer can render. A person called one day to have his likeness taken. As soon as the work had been finished he hurriedly left, on the pretence that he just remembered a call he had to make, but should return in half-an-hour. Weeks passed over, but there came no tidings of him, and, as he had forgotten to pay, I hit on the device of placing the picture in the show-case at the entrance, with a written intimation—"The original has left a parcel up stairs, and any one knowing his address and leaving it the parcel will be forwarded." Shortly after a gentleman called who knew the person. He gave the address, which was in a neighbouring county. I sent in the account and was promptly paid, leaving him quite perplexed as to how I discovered his whereabouts.

I shall here give an instance of the curious incidents which sometimes occur in professional experience. A woman, with a child in her arms, called just as darkness was setting in, and during my absence. She was told that the light was not suitable, and was requested to call on the following day. Deaf to all remonstrances, the picture she would have. An assistant chanced to alight on a specimen of a woman with a child in her arms, gave her that, and told her to call next morning. At an early hour the good dame entered with an indignant frown on her countenance, threw down the picture, exclaiming—"That's no my face, I'm sure; but gie like the bairn, wi' a different frock on!" After a little explanation the picture was taken, when she said—"Aye, Bobby, that's me an' you, noo!"

On one occasion a worthy bailie and his excellent spouse called, the latter being very proud of the high distinction conferred on her lord. When arranging for the picture she was particular in her directions that the badges of office should be prominently exhibited. The massive medal and gold chain having been adjusted and re-adjusted, her last instruction was—"Noo, jist look as if ye wur on the bench, an' the coort a' roond ye!"

A celebrated bagpiper once wanted to be taken in full highland costume, with his pipes placed in an attitude as if being played upon. When placed in position I told him to assume the expression he desired, and then said "be steady." On taking the cap off the lens and turning my back I was astonished to hear the skirling of the pipes. On turning round I found my brave highlander marching about to the tune of "The Campbell's are Coming!" When I remonstrated with him for moving, he replied—"Tid you'll thocht that I want tae pe taen stanin, like a pig stucco?"

During my professional career there are few things I recall with more pleasing satisfaction than the visits I had from the late Dr. Livingstone, and my taking the intrepid traveller surrounded by his family. Afterwards I had repeated visits from him, as he wished a few lessons in photography, with a view to aid him in illustrating natural objects of interest in his second journey, but which proved to be his last. Of course men of the Livingstone stamp are not to be met with every day, and it is the distinguishing value of our art that we are enabled to transmit to posterity their exact features and appearance.

I have also brought my camera to bear on the features of the great sensational preacher, the Rev. C. H. Spurgeon, and the street preacher known as the "Angel Gabriel," with trumpet in hand; also most of our celebrated actors. But the comparison between Livingstone and Spurgeon was so striking to me that I could not but admire the dauntless heroism of the traveller, with his high scientific culture, while the preacher had only the sensational element of the theologian.

Within the experience of all present will be the notable incidents that occur in taking a large group of persons connected with one of our public works, with a due proportion of the fair sex. I have been often amused, puzzled, and driven to my wits' end in arranging the parties to produce the best effect. Perhaps the manager, the cashier, or head clerk may be among the number, and if any of these should chance to be unmarried, and assigned a prominent place in the group, I have noticed the play of feeling among the Clarindas and Juliets as to who should be placed next the coveted Adonis, and of ill-concealed jealousy and envy when the puzzled artist had done all he could to do justice in the grouping. As for Tom, Dick, and Harry, who have something of the devil-may-care spirit about them, one place is as good as another to them; but then some one of the trio has been longer in the works, and holds a better position than others, and does not like to be thrust into a corner, no matter what becomes of his friends. However, after all, the position an individual would like in a picture resembles the one he desires to occupy in the world—the point of advantage—and is just a common feature of our poor human nature.

On one occasion I had a visit from a stylishly-dressed lady, accompanied by two beautiful little boys who were as restless as a straw in a gale of wind. After repeated and sometimes fruitless endeavours to get them to be at rest before the camera, I succeeded at last in taking their pictures. Then followed a somewhat ludicrous occurrence. The lady told her little ones they might play about while she placed herself in attitude for her picture. The urchins, thus set at liberty, speedily found their way into every room of my establishment, and were making free with everything they could put their hands upon, when, suddenly, sounds of a crash came from the dark room. On hastening thither I found to my mortification that they had upset my favourite bath, and were literally dripping all over with the contents. I could not conceal my chagrin in relating the mishap to their mother, who, of course, had no apprehension of what would follow. Naturally she pulled out her white handkerchief and set about wiping the fluid from her boys' dresses. The day was uncommonly hot, and the good lady perspired freely, necessitating the frequent application of the handkerchief to her face in removing the drops. I began to perceive her face rapidly assuming a dusky complexion, as well as the light dresses of the young "hopefuls," and thought it my best course to get them home as soon as possible. On the afternoon I was called upon by the lady's maid, who, amid increasing confusion, related the terrible disaster that had befallen her mistress. Her face and hands were fast becoming black and blue, and her grief was the more intense because she had invited a large party to her house that evening. She had tried soap and water and hard scrubbing to remove the obnoxious colour, but all in vain. She had sent to get a remedy from me; but, from the poisonous nature of the chemicals, I did not think it prudent to entrust the young woman with them, so I thought it better to accompany her to the house of the lady, who at first was inconsolable. Gradually, however, I managed to remove the objectionable colour from her person, and retired amid a profusion of thanks and good wishes.

When in Buchanan-street I secured the services of a French artist who used to turn himself into a sort of Klary reflector. Though very talented in his way, and with a thorough knowledge of the art, he had so many droll eccentricities that I was frequently brought into ludicrous and absurd dilemmas when taking a picture. On one occasion I was startled by the irrepressible laughter and ejaculations of a lady in the glass-house whose likeness he was taking. On my looking in I saw the lady was perfectly convulsed with comical excitement, and before her my French artist with a rod in his hand, to which was attached a kind of oval appendage—black on one side and white on the other. He was going through all kinds of antics, as he sometimes held the black and sometimes the white to the side of the lady's face; but his attitudes assumed so much of those of a dancing-master as to completely banish all the gravity of my fair visitor.

I remember that at an early period in our art, and before the retouching process came into general use, it was customary, especially in the case of ladies, to sometimes apply dusting powder to the face to conceal discolourations or apparent defects. During this practice a lady with a very florid complexion called, and, as usual, our lady assistant, with her dusting powder, was giving her the necessary assistance. The countenance was certainly a brilliant one, and the fair assistant, naturally thinking that an extra amount of powder was really necessary, applied it without stint. The operation being completed my lady visitor, in applying her handkerchief to the nasal organ, unwittingly wiped the powder from the rubicund protuberance. On turning round, the florid nose contrasted so ludicrously with the white of the rest of the face that her friends could not restrain their laughter; and no wonder, for the vermilion appendage closely resembled a very red carrot protruding from a flake of snow!

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[*] Concluded from page 475.

As an instance of the curious cases the photographer has sometimes to deal with I might cite that of a lady, who called with a fine-looking, dark-haired young girl to have her picture taken. Opening a little basket she carried, taking from it a set of fair ringlets, and adjusting them gracefully, she informed me that as papa's hair was light she wished her ringlets to be the same colour. Of course, an artist should always be obliging, and although the little girl's ringlets were of the darkest hazel, she came out in the photograph with locks as fair as Diana's.

One day a scraggy, wizened-faced shrew of a lady wished to have her husband's likeness taken. He was a fine-looking man with a good profile. His portrait was taken three-quarter face. When handed to his "better half," she screamed out—"That'll no dae ava! Ma man has twa lugs, an' there's only ane on that picture!" A lady having a glass picture of herself taken, on being shown the glass, remarked, "and that's my face, but whaurs my back?" I turned round the glass and said "There's your back!" "That'll dae noo!"

One morning, while taking a copy of an American daguerreotype, there was ushered into my studio a pair of sitters from the Emerald Isle. Pat prancing rather near my copying camera, I exclaimed—"Tread lightly! you will spoil my picture! I am taking a copy of a family that are in America." Pat looked to Nora rather mysteriously, but said nothing. When, however, I was in the dark room, Pat whispered to Nora—"Be jabers! here's the family a making on the wall, and an aisy way it is of getting over the job!" "Away wid ye, Pat!" said she; "they could not make it so aisy as that, and thim so far away." Their picture was taken to satisfaction, but it was amusing to see the comical, mysterious look Pat gave to the copying camera, as he slipped past as if he had peas in his shoes. Not long after this I had a call from the same pair. Pat said Nora would give him no peace, night or day, till she had got the picture of her mother, and they wished me to take it. I said—"Very well; bring her up stairs." "But sure and we can't do that, because she is in Ireland." "Well, I cannot take her picture without seeing her." "Sure, didn't yez take our picture, and right well to, and yez turned yer back on us all the time; and didn't yez make the American family, and yez never seen them, and them double further over the sea than the county Sligo. I tell you what it is, I'll give you double the price if you take the ould woman." "And you'll, may be, throw little Bridget into the bargain!" chimed in Nora. I did not know what to make of the couple, and especially Nora, she was so bent on having the likeness. Well I took compassion on poor Pat, as I knew a picture on the wall was better than a mother-in-law sitting in the corner. As Nora appeared bent on one or the other, I told them to look round the place and see if they could find anything like the old woman. At last they fell on the picture of an old Highland woman, which they both agreed was very like what they wanted. "Only," said Nora, "it is not the shawl me mother had." "Well, well! darlin'!" said Pat, "the gintleman, maybe, will give her the loan of a shawl for the occasion." An amateur who was taking lessons with me at the time enjoyed the joke amazingly, took the half-plate picture chosen upstairs, and had a fogged small picture taken, and got one of the artists to alter the dress and shawl a little. The picture, when finished, gave almost entire satisfaction to Nora, and complete peace of mind to Pat, who offered to pay double price. I told him I would not make any charge then. I thought it would require a little more colour, and requested him to bring it back and then he could pay, as I expected he would have the whole family in Ireland taken. Pat has not yet returned.

I once heard a distinguished photographer tell a good story of the olden time, when amateurs were more numerous than at present. One such was receiving lessons from him, and was in the habit, when developing, of placing a piece of white paper behind his negative that he might observe the progress of the development. One day he seemed perplexed, and was fumbling about for something, when, suddenly thrusting his hand into his side pocket, he pulled out the tail of his linen and placed it behind the negative instead of the white paper.

A long time ago a portrait painter called on me desiring work. He had no specimens, but told me if I would give him colours and a portrait I could judge for myself. His work was good, and I gave him employment. He was a tall man, had been through the Crimean war with the Scots Greys, and was rather of a roving disposition. He was seldom long in one place—in Glasgow today, and on his way to London tomorrow. When ensconced in a little room in my establishment I happened to get the loan of a monkey, which my artist induced me to place under his care in his little studio, and the two became close friends. We used to call them "the artist and his pupil," and I often took my friends to see the loving pair—the artist proud of the antics of his little man, as he used to call him, and the monkey quite absorbed in the mysteries of the fine arts. One day Mr. Andrews passed me in the gallery, saying, "I am going out to buy some nuts for Puggie, and will be back in a few minutes." I suspected he wanted something stronger, however. He returned shortly with the nuts, and just opened the door of his studio, when he yelled out—"Am I to be the artist here, or this infernal monkey? Look here, sir!" I went forward, and sure enough the monkey had taken the place of the artist in his absence. Sitting on a chair before the picture with a brush in his mouth, and another in his paw, he was belabouring the kit-kat portrait all over, which appeared as if he had been running up and down the canvas, and he himself so besmeared all over that he was more like a tortoise-shell cat than Darwin's "missing link." On my advancing towards him, he looked up so self-satisfied with his work that I could not help laughing outright in the artist's face, who appeared so annoyed at myself, or the monkey, that he exclaimed—"By gum! since you have let that artist commence on my work, you may let him finish it, as I will do no more here," and away he went. Shortly after this the would-be pupil committed suicide by hanging itself with the chain round its neck. Often since that my artist, in his wanderings, gives me a call, and has a few week's work; but Scotch whiskey is too tempting for him, and away he goes again. This summer I was glad to see him looking better than ever. He told me he had been a teetotaler for a year, and, as a proof, he took a handful of sovereigns from his pocket, and said he had plenty more in the bank.

In giving you these jottings and reminiscences, and before concluding what I fear is but a meagre outline of what might be said of the progress and working of our art in Glasgow and the west of Scotland, I cannot but feel that I have unwittingly omitted a gentleman's name, and one who has done more for the advancement of photography in the west of Scotland than any other man. I refer to the late lamented Mr. John Spencer. I think I can still see his mild and intelligent face, and hear his kindly and attractive voice, while giving instructions to his amateur and professional purchasers of chemicals. All went to him, when in a fix, for counsel and direction, well knowing that his advice would be readily given; and I think I am not wrong in asserting that much of the success of our art in Glasgow is justly due to the warm and earnest interest he took in promoting by every means in his power the well-being of photographic art and artists. JOHN URIE.

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FOREIGN NOTES AND NEWS.

PRIZE FOR A TREATISE ON PYROXYLINE.—HARDENED GLASS ROOFS.—SIEMENS' PRESSURE-HARDENED GLASS.—ART REPRODUCTIONS.—DETAILS OF PROF. DRAPER'S WORK.—CHEAP AND RAPID METHOD OF MAKING OXYGEN.—HONOUR TO DR. STEIN.

WE learn from the *Mittheilungen* that the Association for the Promotion of Industrial Technology has, at the suggestion of Dr. Vogel, offered a prize of 1,500 marks (about £75) for an exhaustive treatise upon the composition of the most important sorts of commercial pyroxyline; upon the influence which the temperature of the acid admixture, in the preparation of pyroxyline, exercises upon the composition and the photographic properties of the product; and, thirdly, upon the properties which the natural or artificial admixtures of the raw material—such as resin in the cotton, size in the paper, &c.—impart to the pyroxyline prepared from them. To the question whether the foregoing points are of such importance that, in spite of recent investigations of the composition of ordinary raw collodion, we still stand in need of further enlightenment on the subject, the *Mittheilungen* answers decidedly "yes," especially in that branch of the subject which deals with the properties of the different sorts of cotton for dry plates and emulsions. The writer of the article says:—

> "In the opinion of many persons a high temperature is of itself sufficient to produce a collodion cotton suited for dry-plate work; others, again, hold that some admixture, such as of gelatine, must find a place in the raw material. The fact is that by using the ordinary silver bath, prepared plates, and ordinary cotton, excellent dry plates—even bromide plates for alkaline development—may be produced; but that when the silvering is done without a bath—that is, by adding the silver salt to the collodion—an emulsion is produced which only furnishes weak, thin, foggy negatives. For such emulsions a cotton specially prepared at a high temperature is recommended. From recent observations, however, it would appear probable that the high temperature of the acid does not alone ensure a good emulsion cotton, but that the presence of some foreign body, such as gelatine, is necessary; indeed, it even appears likely that in presence of the latter a raw material, such as tissue paper, might give a passable pyroxyline at a lower temperature—at least with ordinary paper pyroxyline very good emulsion plates have been got when those prepared with ordinary cotton pyroxyline have been failures. It is further held that many pyroxylines seem useless for washed emulsions, which still furnish good *unwashed* emulsions. In short, there are here a number of questions which demand investigation, and this investigation is the prize subject. A very fertile field is thus offered to any young chemist who may also be acquainted with photography. The prize is substantial, and assistants or students in laboratories have a good opportunity of solving the problem by devoting a couple of hours daily for six months or so to the work."

Who takes up the work is of little consequence so long as it is done; and at the present time, when emulsions and dry plates occupy so much of the photographer's attention, the investigation of the "reason why" as to the suitability or unsuitability of a particular pyroxyline for certain work becomes really a "burning question." Whether the prize offered by the Technological Society produces the desired results of stimulating

German students to puzzle out the problem we shall soon learn, for the solutions must be sent to the Verin Zur Beförderung des Gewerbefleisses, Berlin, Klosterstrasse, 36, in the course of the current year.

At one of the last meetings of the Berlin Photographic Society the question of how best to protect the roofs of glass-houses from damage by hail storms, &c., was ventilated. A special insurance was proposed, but the proposal was rejected on the ground that as these very violent storms were rare the premium would fall heavier on the insurers than the actual loss. Various other projects were then started—amongst others, that of glazing the roof with toughened glass. This last idea is at present being carried out in at least one case—that of the factory of *La Chapelle*, near Vienna, which is being roofed with Friedrick Siemens' (Dresden) patent hard glass.

With reference to the resisting power of Siemens' pressure-hardened glass, the following experiments were made last March at a meeting of the Wiemar Trades' Association:—Two pieces of ordinary plate glass were each supported on four corks, one under each corner; a leaden bullet weighing twenty grammes was then allowed to fall from various heights upon the centre of the glass, breaking the first piece by a fall of thirty, and the second by a fall of forty, centimetres. Three pieces of Siemens' pressure-hardened glass, of the same size and thickness as the former pieces, were then subjected to the same treatment, when the bullet broke one by a fall from a height of 280 centimetres, the second by a fall of 340 centimetres, while a fall of 380 left the third unbroken.

Herr Adolf Ott writes to the *Mittheilungen* that Herr Adolph Braun, of Dornach, has just published an extensive collection of lichtdruck Schnell press reproductions of drawings, frescoes, paintings, statues, &c., in the various galleries of Europe, comprising studies by Raphael, Leonardo da Vinci, Correggio, Titian, Michael Angelo, Paul Veronese, Rembrandt, Rubens, &c., suited for use in schools of art and other classes, as illustrations of the styles of the various masters, &c.

From a private letter from Professor Draper the same journal learns that the discoverer of oxygen lines in the sun's spectrum has been trying since 1872 to photograph the less actinic spectra of stars, and has for that purpose made use of a twenty-eight-inch reflector and a twelve-inch refractor. The task is difficult and requires much patience. Long exposures are necessary, and the atmosphere is seldom in a condition suitable for such experiments. The image of the star must remain motionless in focus for twenty minutes, so that the clockwork that moves the telescope must be very carefully adjusted. In October, 1876, Professor Draper, after experiments extending over four years, got a good spectrum of Venus, showing a great number of lines, and also a photograph of the spectrum of the stars in Lyra and in Aquila. The spectrum of Venus was fainter towards the violet and ultra violet, like the sun's spectrum at sunset. In the spectrum *a* of Lyra broad bands of ultra violet were visible, which are not found in the sun's spectrum.

According to the *Bulletin Belge de la Photographie* Herr Zinno has found a new way of preparing large quantities of oxygen gas. Potassic permanganate and baric peroxide are placed in water, and allowed to act upon each other. By this means 200 c.c. of oxygen gas are evolved from every gramme of the substances employed, so that the oxygen gas required for enlarging or for lighting in any way can be easily, cheaply, and quickly prepared.

On the occasion of the celebration, by the University of Tübingen, of the fourth centenary of its foundation, the King of Würtemberg bestowed on Dr. Stein the rank and title of "Hofrath."

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OPINIONS OF THE LONDON DAILY PRESS ON THE PHOTOGRAPHIC EXHIBITION.

The Exhibition of the Photographic Society of Great Britain.—As the truthful pencil of photography has been employed in the interests of art and science to record the beautiful in landscape and in physiognomy, to note the changing phases of an eclipse, the strange fields of Arctic explorations and of distant countries, it is not without reason that the Photographic Society claims to exhibit among the art galleries of the metropolis. There are not wanting contributors whose skill in picturesque composition proves them to be artists who only employ the sun to draw for them. On entering the gallery at 5a, Pall Mall East, we feel at a glance how simply the magic ray, nature's own reporter, renders the broad effects of features or of landscape and refuses to force details into unpleasant conspicuousness, and as we examine the pictures we realise how much beauty must perish unrecorded but for this art. It is a pleasure to know that these portraits are true portraits, that individuality has not been rounded off for the sake of mere prettiness, and that these forest glades are not all an artist's dream. An artist gives us what photography cannot possess—the image of nature in the soul of a poet, expressed with a touch in itself fascinating; but many painters aim simply to copy nature, and receiving her image only on the eye, and labouring to imitate it with paint and pencil, produce nothing better than an appearance of paint and pains. To this class of works the superiority of a photograph is undeniable. For artists the most valuable photographs are those produced upon a single plate. When the attention, as we may call it, of the lens is fixed upon a face or figure with a background of more distant objects, these inevitably appear indistinct or blurred. The lens thus illustrates what has been happily called the perspective of the mind, and renders in a sketchy manner whatever is romote from the principal subject. Several studies by Mrs. H. E. Roscoe possess this quality.—*Morning Light, Evening Light*, and *The Stonebreakers;* also Mr. Frederick Hollyer's rustic studies from nature. A grand example is found in a large view of Windsor Castle—a carbon enlargement by the Autotype Company. The foreground and the distant castle and luminous sky are in true harmony. It would seem that photographers do not always appreciate the fidelity of the camera in refusing to render all parts of a scene with equal force, for we find many mosaic pictures often skilfully composed for the sake of expressing a subject, sometimes to supply a sky where the exposure of the plate sufficient for sea or landscape has not been long enough to produce an impression of the luminous clouds. It may be questioned whether skies thus separately photographed are in harmony with the ground. Colonel Stuart Wortley's compositions illustrate the difficulties of connecting separate impressions. He contributes valuable transcripts of sea and clouds. To have caught the clouds in their flight, and snatched the curl of the waves breaking into foam, is a service to all who study clouds and waves; but in connecting a sea study with a cloud study the laws of reflection have not been observed. Some photographers—close observers of the harmony of nature—have succeeded in piecing together various impressions, so as to pourtray a subject with all the charm of artistic composition. Mr. R. Slingsby has thus produced an effective picture called *Alone*—a beautiful girl, resting on a bank among low shrubs, overlooking the sea. Every line of the composition is harmonious, and the balance of light and shade most pleasing. The conception of such a subject is equally artistic, whether expressed by the pencil or in the photographic camera. Mr. A. Ford Smith has a group of children, *Birdnesting*. He has had the advantage of pretty girls, and has known well how to pose them. The landscape beyond is also well chosen, and combines well with the foreground; but it is nevertheless more distinctly pencilled than it would appear as background to the cluster of young faces. The advantages of photography are realised in the accurate portraiture of distant lands, their people, and their architecture. Messrs. Stillfried and Andersen send skilfully-treated studies from Japan. The physiognomy of *An Old Man, An Old Gentleman, A Young Girl, and Young Ladies* is most interesting. There are also street scenes and interiors, which bring before us the details of a life novel to Europeans. Mr. Kirsch has recorded the personal appearance of the Cape Kafirs, adding to our knowledge of foreign life and the appreciation of our own. Mr. C. Klary illustrates the graceful dress and interesting types of Algerine people. Mr. G. Nesbitt has produced a delightful picture called *Tired Companions*—a grand old dog and pretty child asleep together on the floor. The group is rendered in pleasant tone, and the lighting carefully studied. The same qualities are found in Mr. Nesbitt's *Bob and His Two Sisters*—fine dogs. Among Mr. A. Boucher's studies is one of a lady in a dress of soft muslin, with many folds and plaitings. The details of the white masses are rendered with unusual delicacy. *A Quiet Cup of Tea*, by Mr. Q. M. Young, is a fine imitation in English subjects of the style of a Dutch interior. Bernard Mischewski contributes several large portraits, which realise all that photography can attain. We prefer No. 296, on account of the grace of pose and lighting of the subject. The features are rendered in that half-tint best adapted to the subtle gradations of form, and light falls upon the neck and a too bright string of beads—the only blemish. No. 387—another portrait by Mr. Mischewski—is magnificent in tone, but the impression has been somewhat retouched. Many photographs are injured by an attempt to brighten the eyes and define contours which should melt into nothing. Da Vinci or Correggio would not have corrected a photograph for leaving the contours undefined. *Clarissa*, by Valentine Blanchard, is most artistically draped and posed. The attention is filled with the expressive face, and the less interesting material of the picture is only sketched. A glance at a case of 75 portraits of children convinces us that they were taken instantaneously, so unaffected are the attitudes of the little sprites, caught like birds on the wing. Mr. Faulkner's enlargements of these instantaneous pictures are very satisfactory. On the table we find the photographs taken during the Arctic expedition under Sir G. Nares; *facsimiles* of ancient manuscripts, of the *Common Place Book* of John Milton, of ancient coins and Roman medallions, all the admirable and unfading productions o? the Autotype Company. We are grateful to Mr. Milman Brown for *A Glen Study*, an avenue of rare beauty. Mr. Gutekunst sends from Philadelphia views of the Centennial buildings, and portraits of peculiar delicacy on porcelain. One is Longfellow, and in the same frame a smaller likeness of an aged Quakeress, the eloquent philanthropist, Lucretia Mott. The specimens of their art produced by the Royal Engineers' School of Photography do not need that we should call attention to them, and many other works, too numerous to mention, make the walls of this gallery attractive, either by novelty of foreign scenes or the dear familiarity of English landscapes.—*Standard*.

Photographic Society.—Viewed collectively, the present exhibition of the Photographic Society is eminently creditable to the exhibitors.

The sun-limned pictures, more numerous than on any former occasion, are in all varieties of style and subject, and among them will be found many works of remarkable beauty. It is satisfactory to observe that, many and meritorious as are the photographs contributed by foreign artists, more particularly by Germans and Americans, the English photographers hold their own against all competition, and worthily sustain the high reputation of the British school. Colonel H. Stuart Wortly's sea studies are unsurpassed for truthful expression of the tremulous action of water, for accurate delineation of all forms of vegetation on the foreshore, for picturesque arrangement of clouds, and for splendour and variety of atmospheric effects. Mr. H. P. Robinson, of Tunbridge Wells, is famous for his skill in composition and his masterly treatment of light and shade. His merits in these, as indeed in many other respects, are displayed to briliiant advantage in one of the best pictures in the gallery, that entitled *When the Day's Work is Done*—a cottage interior, with an old man reading the Bible, while his wife, of equal antiquity, keeps solemnly knitting. A variety of picturesque landscapes, by members of the Royal Engineers' School of Photography; views in Switzerland and elsewhere, executed from dry plates, by Mr. W. England; Welsh landscapes, by Mr. Robert Crawshay, of Cyfarthfa Castle; Arctic views, by Mr. J. A. Grant; studies of horses, by Mr. D. Hedges; and of cats by Mr. H. Pointer; portrait studies by Mr. Valentine Blanchard, Mr. Jean Baptiste Frilner, Mr. Taeschler, Mr. A. Boucher, and Mr. Carlo Relvas; and numerous works in the departments of scenery, *genre*, and portraiture by Messrs. Beasley, Jun., Bowness, Faulkner and Co., G. Nesbitt, H. B. Pritchard, C. Klary, R. Slingsby, J. Hawk, R. V. Harman, James Howie, Payne Jennings, M. Kisch, and the Autotype and Woodbury Companies may be commended to the special attention of the visitor. Upon the table will be found a very interesting collection of photographs taken during the Arctic Expedition under Sir G. Nares, and lent for exhibition by the Lords of the Admiralty.—*Morning Post.*

Our Editorial Table.

Groups and Landscapes. By R. P. Yeo, Plymouth.

When men of science meet once a year in conference to discuss matters of scientific interest, they usually manage to import into such annual congress as much pleasure as is consistent with the fulfilment of their duties. Hence pleasure trips and *al fresco* entertainments of various kinds have long become a recognised and exceedingly popular element in connection with the annual meetings of the British Association for the Advancement of Science. On the occasion of these "excursions" the members are not unfrequently accompanied by a photographer, who manages to secure one or more groups of the party. The pictures now under notice were taken under these circumstances by Mr. R. P. Yeo, of Plymouth, who has thus secured valuable mementoes of some of these pleasant trips, during which large parties of members of the Association paid visits to some of the charming spots and places of interest in which Devonshire abounds. The pictures sent us by Mr. Yeo represent respectively what we may designate the "Lee Moor Groups," the "Cheesewring Groups," and others not so strictly confined to the members of the Association and their friends. In these photographs one can easily recognise many of the more prominent members of the scientific world comprised in these groups. Under the most favourable circumstances it is difficult to group and photograph masses of people so as to secure effective pictorial results, and much more so is this the case when the operations are conducted at a distance from home; yet Mr. Yeo has in these photographs succeeded admirably in producing pictures which will prove lasting *souvenirs* of enjoyable excursions.

The Dublin University Magazine for October.

London: Hurst and Blackett.

The portrait in this month's number is that of the Rev. Hugh Reginald Haweis, M.A. Men of science and of enlightenment will cordially homologate the statement that the portrait is that of "a clergyman who is a traveller, a musician, a journalist, an author, a divine without cant, a preacher without commonplace, a parson who is in sympathy with the advanced tendency of his age, who knows his own mind and is not afraid to speak it." This, indeed, is the character of the man whom the camera of Messrs. Lock and Whitfield, aided by the wonderful skill of the Woodbury Company, have presented to his numerous admirers and sympathisers through the ever-attractive "Portrait Gallery" of the *Dublin University Magazine.* In saying that it is quite equal, artistically and technically, to the other portraits in this series about which we have expressed our opinion, we leave nothing more to be said. The literary contents are varied. In *The Early Days of Mortimer Collins* we have this recently-deceased writer treated of as a schoolmaster and a poet; in a succeeding number his career as a journalist will form the theme. This series is replete with interest. The scholarly article of Dr. Keningale Cook, quaintly entitled *Did Jesus Know Greek?* is not the least valuable of the various papers.

Lazy Lays and Prose Imaginings. By William H. Harrison.

London: 38, Great Russell-street.

Some of these poems and prose essays have, we learn from the preface, been previously printed in daily newspapers and in serial publications, while the others are now issued for the first time. This announcement enables us to state, what we otherwise should not have thought of doing, that the humorous article, *How Hadji Al Shacabac was Photographed*, which some years ago appeared in The British Journal of Photography, and was signed "Al Shacabac," bears a filial relationship to Mr. Harrison, who was the writer. This amusing article finds a place among the *Lazy Lays*, which include many admirable pieces, some of which are in verse and others in prose, some scientific, others social and political, but all of them excellent. In *The Poetry of Science* we are told of science that—

> Her's is a realm of fairy land,
>   A scene of endless change,
> Where eye and ear are all confused
>   With wonders passing strange.

The *Lay of the Photographer* is a scientific ballad in which are allegorically described the various manipulations incidental to the preparation of dry plates:—

> Young Pyroxyline has come out of the west,
> Where he lived with dark niggers, not very much dressed.
> All regardless of safety, he plunged in the brine,
> To keep watch and ward o'er the fair Iodine.

The loves of the two, and their subsequent career, are graphically narrated in flowing verse.

The late meeting of the British Association at Plymouth has furnished Mr. Harrison with a subject for his pen. *The Lay of the Mace-Bearers* is founded upon an incident at the first of the two *soirées* held during the recent scientific congress. On that occasion the mayor attended "in state" and moved up and down among the company during the evening, "prefaced," so to speak, by three mace-bearers.

The *Lazy Lays* will make excellent and amusing reading for an occasional spare half-hour. They contain nothing unrefined or in bad taste.

Street Life in London. Part IX.

London: Sampson Low and Co.

The October number of *Street Life* contains the following illustrations (printed by the Woodburytype process), viz.:—*The London Boardmen, The Water Cart,* and "*Mush-Fakers.*" The first of these requires no expositor. Advertisements carried by boardmen ("sandwich-men," as they are sometimes irreverently designated) is a sight too familiar in the streets of London to render description necessary. The photographic illustration is thoroughly characteristic. The best of the pictures is styled *The Water Cart*, the horse being well rendered. The descriptive matter, as usual, is accurate and suggestive.

The Losing Game. By Murray Russell.

London: Tweedie.

This is a tale of commercial life, and one of the most powerful and sensible books written in the interests of the temperance movement that we have seen. The name of the author will be familiar to our readers as that of a graphic contributor to this Journal. The writer displays an intimate knowledge of the habits and customs of commercial travellers, who are the chief actors in the scenes depicted in *The Losing Game.*

Meetings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The opening meeting of the present session of this Society, held on the 11th inst., was rather thinly attended. The President occupied the chair. Messrs. Malony and Houghton were elected members.

Mr. William Brooks read a paper on *Spots on Emulsion Plates: their Cause and Cure.* [See page 483.] At the close of his paper Mr. Brooks exhibited a flat tin hot-water bath, which he found convenient for drying plates.

There was no formal discussion on the paper, what transpired being confined to a few questions and explanatory answers respecting points on which the readers of this Journal are already informed. A vote of thanks was awarded to Mr. Brooks.

It was intimated that the next ordinary meeting of the Society would be held on November 1st, and that the Technical Exhibition would be held on November 15th. The proceedings then terminated.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

The board of management held their monthly meeting at 174, Fleet-street, on Thursday, the 4th inst.

The minutes of the previous meeting having been read and confirmed, the subject of the removal of the office was then considered, and, after some discussion, the following resolution was passed:—"That the Secretary be authorised to give due notice of removal of the Society's business from 174, Fleet-street, and that he engage the room at 160a, Aldersgate-street, E.C., as the Society's office, upon the terms placed before the board." At the latter place the board of management will meet on the first Wednesday in every month, at eight p.m., instead of Thursday, as previously.

Members are requested to note the removal in their rule books, &c.

The meeting was then adjourned till Wednesday, November 7th.

EDINBURGH PHOTOGRAPHIC SOCIETY.

The first ordinary meeting of the season was held in 5, St. Andrew-square, on the evening of Wednesday, the 3rd inst.,—the President, Mr. John Lessels, in the chair.

The minutes of the previous ordinary and outdoor meetings were read and approved, and Messrs. T. W. Drinkwater and John Todd were admitted ordinary members.

Dr. Hunter exhibited a large collection of water-colour and other sketches of scenery in the highlands of Scotland and north of Ireland, with a view, in the first place, to offer suggestions to photographers as to localities rich in the picturesque; also to seek information as to the best means of getting them reproduced by photography, and how best to finish them for that purpose. The exhibition elicited a good deal of discussion, the outcome of which was that the sketches should be finished in monochrome, with indian ink warmed up a little with brown, or in grey, and that such of the mechanical processes for printing in carbon as was found most suitable in relation to the number of copies required be selected.

Mr. W. T. Bashford then read a paper entitled *Odds and Ends*, which turned out to be a review of the work of the Society during the past four years, in which he found fault with much that had been done, both as regards the work itself and the manner in which it had been accomplished. He also expressed a wish that the business of the ordinary meetings should take a more practical form, and that for the benefit of younger members such elementary proceedings as the coating of a plate with an albumen substratum should be shown and illustrated.

Dr. Thomson said that Mr. Bashford was generally so practical in his observations, and had frequently such interesting information to give, that he had come to the meeting on purpose to hear him; and, while he did not agree with all that he had just heard read, he had listened to the paper with much pleasure, as it contained some valuable suggestions. But as he had not had time to digest the subject he could not at present say more on it.

Mr. Dobbie agreed with all that Mr. Bashford had said. He knew from his long experience that he would have something to say that was worth listening to, and had come to the meeting on purpose to hear it. Although the Society numbered over three hundred members the business was mainly conducted by about a dozen. So long as the Society agreed with them all went on well; but when it did not do so things were not so pleasant. He believed that, although the influence of the popular meetings were of a transitory nature, they had added much to the membership of the Society, and thought that the practical papers suggested would do much good.

Mr. N. Macbeth thought that if, instead of always having regular papers, which often served no practical end, each member would from time to time bring specimens of his work, it would give rise to discussions of great value and elicit much useful information.

The business then took a conversational turn, the subject being the relative advantages of collodion and gelatine emulsions for the preparation of dry plates.

The President stated that he had recently tried those prepared by Messrs. Gray and Truefit with the gelatine emulsion introduced by Mr. Gray, and found them better than anything he had yet used. They were quite equal to wet collodion in rapidity, and developed into clean, beautiful negatives.

Dr. Thomson had recently seen a lot of portrait negatives both on collodion and gelatine films, and had had no difficulty in picking out the best, and they were all gelatine.

Votes of thanks were given to Dr. Hunter and Mr. Bashford, and the meeting was adjourned.

BRISTOL AND WEST OF ENGLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

The annual meeting of this Association was held, as usual, at the Museum, Queen's-road, Bristol, on Wednesday, the 3rd inst.,—Mr. E. Brightman in the chair.

The Secretary having read the minutes of the previous meeting, which were confirmed, Mr. Radcliff, of London, was elected an ordinary member.

The Secretary then read the report for the past year, ending October 3rd, 1877:—

ANNUAL REPORT.

Your Council, in presenting the report for the past year, desires to congratulate you on the steady increase in the number of members, there having only been one indoor meeting at which one or more have not been elected.

The following papers have been contributed by members, to whom the Association is greatly indebted and tenders its best thanks:—

Intensification of Wet Plates with Iron. By Mr. E. Brightman.
Light, Exposure, and Development. By Mr. H. A. H. Daniel.
Notes on Photographic Chemicals and their Adulteration. By Mr. W. W. Stoddart.
The Waxed-Paper Process. By Mr. P. J. Worsley.
The Collodio-Albumen Process. By Dr. G. H. Thompson.

The thanks of the Association are also due to the Committee of the Bristol Museum for placing a room at its disposal on such advantageous terms.

The financial position of the Association is satisfactory, the balance of income and expenditure having been adjusted to within a few shillings.

The monthly evening meetings have been fairly attended, although, looking at the attractiveness of the papers read and subjects provided for discussion, there is room for improvement.

Your Council regrets that the three outdoor meetings have been so poorly attended, especially as it was generally expected they would prove, if anything, the most popular.

Your Council strongly urges and hopes that every member will do his best to at once resolve that few, if any, of the evenings announced on the cards for next session shall be engaged to the exclusion of the Association's meetings. It also hopes that the outdoor excursions will prove *the* popular meetings of the future, and that they will be attended by a larger number of working members.

In conclusion: your Council urges the desirability of each, individually, doing his utmost to increase and popularise the Association.

Lieutenant Lysaght moved the adoption of the report, which was seconded by Mr. Bryden.

The accounts, which had been audited by Messrs. Davey and Bryden, were presented and passed.

The Council for the ensuing year having been elected, the meeting was adjourned.

In June and August outdoor meetings of the above Association were held—the first at Tintern, and which was mostly of a social character; and the second at Froom Glen, near Bristol, at which nearly all present worked, the wind which prevailed, however, cramping the amount of work which might have been done. The July meeting was prevented from being held in consequence of the inclemency of the weather.

Correspondence.

DENSITY.

To the Editors.

Gentlemen,—I have just read with great interest the very interesting article in your issue of yesterday respecting density; and, since I introduced the use of acetate of soda, phosphate, &c., in facilitating the formation of dense images in emulsion plates, allow me to make a further statement.

I find most of the organic neutral salts of the alkalies—such as the phosphates, acetates, formates, &c., of either soda, potassium, calcium, or ammonium—if introduced into the organifier for a *washed emulsion*, have a very beneficial and marked effect as regards density, and they also affect the colour of the image.

I am pleased to see that your experiments corroborate mine as respects producing a negative from a negative by the nitric acid process. If you remember, I stated at one of the meetings of the South London Photographic Society, at the beginning of the present year, that it seemed to me impossible to get any intensity unless all traces of the acid were destroyed by an alkali before the re-exposure to light, and that any amount of intensity could be obtained by re-organifying. I do not remember at the present moment whether this was reported in your pages. I now find that if after the nitric acid is washed off the plate be treated with a weak solution of carbonate of ammonia and acetate of soda, and *then* exposed to light, on the addition of a drop or two of the alcoholic pyrogallic stock solution the pale-looking image of bromide of silver will gradually darken and gain in intensity, and is under perfect control.

I think there is a wide field for research in the use of the salts above-named for producing various results.—I am, yours, &c.,

Reigate, October 6, 1877. William Brooks.

◆

GELATINE EMULSIONS.

To the Editors.

Gentlemen,—Referring to Messrs. Wratten and Wainwright's concluding notice of me, I may point out that they knew what quantity of emulsion I made at one time before they first condescended to notice me at all. In my first communication I described the making of one ounce of emulsion and the apparatus used. The same apparatus answers just as well for two or three times the quantity, and that, I think, is as much as any amateur would care to make at once.

I am sorry Messrs. Wratten and Wainwright should have had the trouble of attacking what they thought was an obstacle, but which they now discover to be something quite beneath any further notice. I will endeavour to survive their decision, and go on in my own way, or in theirs should I eventually find it better than my own. I am not at all prejudiced, and am quite willing to be convinced.—I am, yours, &c.

Ipswich, October 6, 1877. G. Morton.

◆

"TREATISE ON LIGHTING."

To the Editors.

Gentlemen,—As the publishers of the little pamphlet referred to by "Free Lance" in your issue of the 28th ult., allow us to inform your correspondent that he has hit the right nail on the head when he suggests our reasons for publishing it.

Believing that there is no royal road to art, we naturally look with a suspicious eye upon most of the patented and secret "processes" got up by foreign adventurers, heralded by a flourish of showy testimonials, and offered to the confiding Britisher for a good round money consideration. When we recently perused a pamphlet (which cost 100 francs) on the subject of lighting the sitter by means of screens and reflectors, we at once thought that the acme of process-mongering had been reached; for, in truth, had not the whole sum and substance of it been published both in the American and English journals over three years ago? We have it in print before us at the present moment, and the fact is placed on record that Mr. Carl Meyer patented the invention in the United States, though he never did in this country. Then why, we ask, should the English photographer be "sold" to the tune of 100 francs for information which was already public property, and could be read in the pages of his own photographic literature?

The principle of lighting by the means of portable screens is undoubtedly good, and in the wish to see it more generally adopted in this country we published the small circular under notice, post free for a stamp; and as the edition is very nearly exhausted we believe the subject has not been without interest to the profession.—We are, yours, &c., D. H. Cussons & Co.

Southport, October 9, 1877.

◆

THE AUTOTYPE PATENTS.

To the Editors.

Gentlemen,—I saw Mr. Urie's letter in your last week's Journal, in which, amongst other things, he asks what the Autotype Company have to give for the extra £25. As I have just returned from Ealing Dene, after having had my five-and-twenty pounds' worth, I may just as well, with your leave, say what I got.

I paid £30 in all, save an allowance for my second-class return fare. After signing and obtaining my license I went down to the works at Ealing Dene and saw Mr. Sawyer, who, after showing me some interesting departments in the works, handed me over to Mr. Foxlee, and under his guidance, and that of Mr. Shepherd, the head operator in the chromotype department, I got a thorough insight into the business. I took some negatives with me, and the prints that I at last succeeded with are very superior to any silver prints I ever had from the same negatives.

We used the Lambert frames, which I see Mr. Urie says "none but a lunatic would think of using." I do not profess to know much about it, but they seem to me very convenient and just the thing; and Mr. Shepherd told me that to his personal knowledge they were very extensively used in the north of England. I think he said Mr. Sachs used them, and it was seeing some of that gentleman's fine pictures that first tempted me into going in for chromotype.

However, to make a long story short, I spent some days at the Autotype works, was made perfect in chromotype, taught how to reproduce negatives, to make enlargements, transparencies, and a good deal more besides. I had my frames fitted up—name and address all complete—and feel sure that with a little practice I can work chromotype to a profit.

I understood there were some special tissues. I do not know much about those, as I do not like the Lambert purple, having a preference for the brown tones. All the tissues I saw there worked very well. Then I had ten per cent. discount off all the materials I bought, and understand that the same discount will be taken off in the future from the market price of the materials, whatever it may be.

I should certainly have hesitated had I seen Mr. Urie's letter before and not known anything about the company; but as I have done business with them for some time now, and always found them straight, I was surprised to see Mr. Urie speaking so ill of them—talking of their crooked ways and suchlike. However, if you can make my plain statement fit for your Journal, will you give it a place? You see I belong to "Saint Bloater," and will excuse my not being very ready with my pen; but as I have been well treated myself, and quite satisfied with my bargain, I hope you will allow me to say so.—I am, yours, &c., R. W. Miller.

Great Yarmouth, October 8, 1877.

To the Editors.

Gentlemen,—Whatever may be the value of the "Autotype-Urie" controversy it is confessedly amusing. Mr. Urie admits being "rather amused" at our remarks, and we plead guilty to being "very much amused" with his letter of last week; in fact, we are keeping it as a *bonne bouche* for the next little convivial meeting of our company. Well, *Messieurs les Editeurs*, if you are amused, and your readers are amused, it is a very nice little comedy all round, and so here goes for some more fun.

Mr. Urie is a very Proteus in argument. Met at one point he appears in another shape at a new one; he never knows when he is beaten, and will probably never be convinced that he *did* "trail the red herring" to the Glasgow Society. Mr. Urie says—"It is a well-known fact that a patent may be renewed by the party *holding the right* showing that a sufficient return has not been made." Will Mr. Urie be "surprised to hear" that this is a good specimen of his usual inaccuracy—that it is not a "well-known fact," nor even a fact at all?

What the act says is that a *patentee* (not the holder of the right, mind, but the *patentee*) may apply, on advertising in a certain specified manner, to the Privy Council for a prolongation of his term, and that if the judicial committee report in his favour such term may be prolonged for seven years. When we asserted that the patent for tissue-making could not be prolonged because Mr. Swan (the patentee) was not in a position to make any application to the Privy Council, Mr. Urie replies that he has no doubt "that Mr. Swan could declare with a clear conscience that the amount that came to his share was small indeed." Now Mr. Urie has not the slightest ground for this innuendo, and in writing in this way he very far exceeds the limits of fair controversy. Mr. Swan disposed of his patent to the Autotype Company, which was formed for the express purpose of purchasing and working his patent. He disposed of it on his own terms, and we have yet to learn that any of the Autotype Company's engagements have been dishonoured. Mr. Urie cannot get over the fact that Mr. Swan sold his patent on his own terms, was duly paid for it, and was thereby precluded from applying to the Privy Council for an extension of the term, that nobody else had any *locus standi*, and that, consequently, Mr. Urie led the Glasgow Society a "wild-goose chase" that turned out neither pleasant nor profitable.

We shall not follow Mr. Urie into *his* estimate of the value of the Lambert patents. The Scotch folks are supposed to know the value of things as well as most people; and it was not only a *Scotchman*, but a *Glasgow* man, who gave M. Lambert a good round sum for his patent rights in Scotland. But it has just struck us that Mr. Urie must be contemplating taking out a license himself, so anxious does he appear to depreciate the property. "It is naught! it is naught! sayeth the *buyer;* but when he is gone his way then he boasteth." Ah! Solomon! ye were a "wise chiel," and knew a thing or two.

Mr. Urie still persists that the process of Lambert is an infringement of Johnson's patent. We have already pointed out that it could not be an infringement if the holders of Johnson's patent gave Lambert and Lambert's clients leave and license to use it; it is mere nonsense to assert the contrary. We presume Mr. Urie understands English and knows what the word "infringement" means; otherwise we must refer him to a dictionary.

We now once more bid farewell, a fond farewell, to Mr. Urie; we are so busy pushing our "obstructive and dying monopoly" (*vide* Mr. Urie) that we must decline to amuse ourselves any longer. There are many things that will never be cleared up by letter-writing, and the merit and value of the autotype patents are amongst them. We shall have pleasure in granting licenses to all who wish for them in good faith, feel disposed to work them, and, like many others, make a profit out of them. For Mr. Urie's imputations of double-dealing and bad faith we have the most supreme contempt, and are quite content to leave our reputation in the keeping of our numerous customers and licensees.—We are, yours, &c., The Autotype Company.

[We must now terminate this discussion.—Eds.]

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Notice.—The Photographers' Benevolent Association have removed from 174, Fleet-street, to 160a, *Aldersgate-street*, London, E.C., at which office the Board of Management will hold their meetings on the first *Wednesday* in every month, at eight p.m.

EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale*, that being done at a small cost in our advertising pages. This portion of our columns is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

Wanted to exchange, a lantern and few slides, new, for a quick-acting *carte* lens.—Address, E. J. Holmes, photographer, Cranbrook.

About £4 worth of jewel and other fancy cases in Morocco, Russia, and velvet, offered for a sciopticon or magic lantern.—Address, D. W. J., Colne-house, Mostyn-street, Llandudno., N. Wales.

◆

ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

George Willis.—Accept our sympathy.

J. R. J. (Paris).—Your request shall receive attention.

Tag.—The same proportions as those used in gold toning will answer.

Geo. B. Russell.—Yes; it was duly received and handed to the owner.

D. W. J.—After dissolving the glue in water add to it sufficient nitric acid to prevent it solidifying upon getting cold.

F. St. G.—Gold may be precipitated in a metallic form from a solution of the chloride by the addition of a solution of protosulphate of iron.

G. M. W.—We have merely to repeat what we said some time ago to another correspondent, viz., that we are not yet in a position to offer any opinion upon the lens about which you maka inquiry.

Thos. Flett.—To ascertain the value of the acetate of soda in the developer make up the various ingredients, omitting this one, and, after developing two pictures without it, make the requisite addition and try again.

Reekie.—When the prints have been thoroughly washed allow the water to drip from them for a short time, and then place them between folds of blotting-paper. They may afterwards receive a final flattening by means of a hot iron.

A. Moss.—If you can manage the burning-in, there will be no difficulty in placing the portrait upon the stone. Let it be produced upon glass, and remove the film; then, after toning, let it be carefully transferred (under water) to the stone.

A. Marshall (Boston).—We have not yet heard of the arrival in this country of the gentleman named; but any communication for him sent to our care will be handed to him immediately on his arrival. We shall write privately very soon.

Captain G.—We do not think that the intensity of moonlight is such that a dry plate would fog if it were developed by the light emitted by our fair satellite. The experiment may, however, easily be tried in ten days hence, when the moon will be full.

T. P. J.—For preparing a plate for engraving there must be no pigment of any kind mixed with the gelatine. It being important that the film be as transparent and free from colour as possible, the proportion of bichromate present must be the minimum.

Cadmus.—1. Let the bath be decidedly acid. Also try the effect of fuming the paper (after being sensitised) with ammonia.—2. Furnish us with as full particulars as possible concerning the condensers, and we shall then be able to offer better advice than we can at present.

Don.—1. We do not see any reason why the hyposulphite of soda should not be kept in solution, if you find that to be a convenient form.—2. Let the degree of dilution be such as to have about three pints of water to the pound of soda.—3 The collodion may be used for cleaning plates or if the quantity damaged be large the ether and alcohol may be recovered by distillation.

"Jane Conquest."—We have received from Mr. F. York a copy of the affecting little poem of this name, so well known to those who visit the Polytecnic Exhibition, where it is illustrated in dramatic form. Mr. York has happily adapted it to the magic lantern, the pictorial illustrations being taken from life. The entire set of pictures are to be seen in the present Photographic Exhibition.

Messrs. Patterson and James (Ramsey, Isle of Man).—From this firm we have received a very nicely-executed "imperial" photograph representing a young lady—one of the staff in the telegraph office, Ramsey—in the act of listening, through the agency of the telephone, to a song which is being sung in Douglas. Our correspondents humorously suggest that the song might appropriately be "Thou art so near, and yet so far." We thank them for the interesting picture. We may incidentally remark that the telephone made use of on the occasion referred to is constructed (by Mr. Richardson) upon an entirely different principle from the American invention.

T. W. T. (Leeds) says:—"Seeing that you take pity on unfortunate amateurs who are struggling with the difficulties of photography, I take the liberty of asking for a remedy for the following:—I very frequently, when taking a photograph of a black surface (the black being used as a background) I find, on fixing, that instead of the black being represented by clear glass it is covered with white lines. I have looked through your Journals and several hand-books, but cannot find out the cause. If you can oblige me by pointing out the cause and remedy in your Journal, I shall esteem it a very great favour."——The effect described is so entirely opposed to our own experience that we throw the question open to others, merely observing that if, when photographing such a substance as black velvet, and giving it an exposure not too long, the shadows are not represented by clear glass, it indicates that the silver bath is disorganised, and must be "dosed," so as to get rid of the fogging.

Varnishing Negatives.—An effective method of warming negatives previous to their being varnished was shown at the last meeting of the Glasgow Photographic Association by Mr. A. Robertson, the Hon. Secretary. It consists of a hot-water bath, of an inverted V form, against the flat sides of which the plates are laid till warm. The heat is retained at an equable degree of temperature by means of a gas burner placed underneath.

Received.—"Colourist;" "Light;" and other communications. These shall be attended to in next number.

◆

Civic Dignity.—We are pleased at learning from the leading Scotch newspapers that Mr. John Stuart, of Buchanan-street, Glasgow, the energetic President of the Glasgow Photographic Association, has been elected to the office of chief magistrate of Helensburgh. We congratulate the inhabitants of that pretty and thriving town on the wisdom displayed in their choice of a provost.

Improved Filters.—The readers of our issue of last week will have noticed, in the report of the meetlng of the Glasgow Photographic Association there given, an account of a new kind of filter that has been devised by Mr. Ross, formerly of Glasgow. These will prove a great boon to the photographer, who frequently experiences annoyance from the giving way of the filtering paper when the liquid is passing through it. The peculiarity of the new filter consists in strengthening the paper by means of gauze, lace, or other textile material having wide meshes. While this confers strength, it also secures great facility for the liquid passing down between the inner wall of the funnel and the paper—a property specially invaluable when the liquids to be filtered are of a viscid nature. From Mr. F. York we have received samples of these filters, which bear out all that has been said in their favour; and we may direct attention to the fact that they are also to be seen on one of the tables in the Photographic Exhibition.

An Adjustable Camera Stand.—Mr. J. Lane has submitted to us a new head for a tripod-stand which he has lately devised and executed, originally, we believe, to suit some requirements of Mr. Warnerke, who, in taking a panoramic view in the manner we described more than a year back, finds it necessary to secure the most perfect adjustability of the camera. The new "head" devised by Mr. Lane is indeed universal in its power to confer a perfect level; for, while it has all the motions hitherto obtained by a ball-and-socket joint, it also possesses that special rigidity conferred by the old triangular top. These advantages are obtained by making use of a double triangle, with one of which the legs of the camera are connected in the usual manner, while to the other is attached a small circular table to which the camera is screwed, and which has an universal movement relative to the triangle—a movement controlled by screws like those in a theodolite, or level. The bulk occupied scarcely exceeds that of a stout triangle of the ordinary kind, and we cannot doubt that its introduction will be most fovourably received.

Photography in Court.—Millard *v.* Terry.—This was an action brought in the Bloomsbury County Court, on Friday last, before Mr. Judge Russell. The plaintiff, a photographer, residing in Camden Town, sued the defendant, a monumental architect, of Highgate and Kentish Town, to recover the sum of £5, being the amount agreed upon for a series of photographic views of monuments erected by the defendant at Highgate Cemetery. The plaintiff was represented by Mr. Lewis, while Mr. Howe appeared for the defence.—The plaintiff stated that he went, by defendant's instructions, to photograph two monuments at Highgate; but his assistant having broken one of the negatives he had to take a second journey of three miles to replace it by another. On its completion he showed it to the defendant, who said he was perfectly satisfied with it, upon which he (the plaintiff) printed from the negatives. Having mounted the proofs he forwarded them to the defendant, who had kept them for three months and had not complained of either the work or the price charged for it until the present action was brought. —The plaintiff's operator stated that the defendant's orders had been carried out and every care taken in the printing, and that when taken home the defendant said he would call upon the plaintiff, but had not done so.—In cross-examination the plaintiff said the work was correctly executed, and, considering the distance, the charges were very reasonable. —Mr. Howe, on the part of the defendant, said that the work was not only badly executed but not in accordance with his client's instructions, and, further, that the charges were very high and were never agreed to by his client. He (Mr. Howe) said he had two skilled photographers in court to prove the work was not that of an artist.—The Judge did not consider that necessary, as if the defendant had any objections to make he should not have waited till he was summoned, but should have returned the goods at once, instead of keeping them for three months. His Honour, therefore, gave judgment in favour of the plaintiff, with costs.

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 911. Vol. XXIV.—OCTOBER 19, 1877.

SUBSTITUTES FOR GLASS IN LANDSCAPE PHOTOGRAPHY.

When glass first took the place of paper in the production of photographic negatives it was felt, and with reason, that a great advance had been made towards the attainment of more perfect results. Photography, however, at that period was in a very different state as compared with the present time; and it is perhaps not to be wondered at that with the advancement of our general ideas in the art a partial subversion of preconceived notions should occur. There can be no doubt that during the last few years a growing feeling has been manifested that glass is not everything that could be desired—at least for landscape work. Its bulk and weight operate seriously against it in that branch; while its fragile nature as well as its expense may be counted as minor reasons for seeking an efficient substitute.

The chief advantage supposed to accrue from its use as compared with paper was the production of finer detail; and while in the main we are disposed to fall in with this view, we are not certain that for pure landscape work—unless it be for very small pictures—the advantage is very marked. We have seen calotype and waxed-paper negatives many years old which, for sharpness and general delicacy of definition, are capable of giving prints quite equal to the best collodion negatives of the present day. Perhaps the class of negative is not such as would be found most suitable for the modern "pocket" camera; but for sizes from 8 × 5 upwards we see no valid reason why the old-fashioned negatives should not give as good results as the newest, and with what a saving in weight and expense to the landscape photographer!

A few practical attempts have been made to secure the advantages of portability without losing the excellence of result obtainable with the more bulky glass support. Chief among these may be noted Mr. Warnerke's flexible tissue, which, in connection with his ingeniously-contrived "roller slide," supplies almost all that could be desired as regards portability and convenience. Another system, pioneered by Mr. W. B. Woodbury, attacks the question in a different manner. A portable flexible support is made use of temporarily to relieve the photographer of the weight of the considerable quantity of glass necessary for a lengthened tour. In this system the films are prepared, exposed, and developed upon glass in the ordinary manner, and afterwards transferred to a temporary support consisting of a suitably-prepared paper, from which they may be again, at a convenient time, re-transferred to glass or other support if desired. By this means it is possible, with a very limited supply of glass, to "keep going" on a tour of any length, the same plates being used over and over again, the stripped films adding nothing to the weight of *impedimenta;* while the trouble involved in the transfer process and the re-coating of the plates with a washed emulsion will form but a slight obstacle in the eyes of the practical and energetic photographer.

Though both these methods are excellent we do not suppose that they will satisfy the requirements of *all* photographers; there is a class amongst the workers in our art-science who can never rest satisfied that the best has been attained, and who, exhibiting a spirit of independence, prefer to work out a system of their own rather than follow blindly the lead of others. This is as it should be, and now that the outdoor season is drawing to a close we would call the attention of the experimenting class to the subject under notice. Far too many of our amateurs, when the "season" is over, pack away their apparatus until spring comes round again, ignoring the fact that there is work for all seasons. The winter months, indeed, should in one respect be the busiest—the summer, with its fine weather, the holiday. We are just finishing our holiday, and doubtless many of our readers can look back upon some days of real hard work in pursuit of pleasure, and will, therefore, be all the more ready to devote the coming long evenings to a diligent search after a means of lightening the labour for the future. What is required of them is not so much the discovery of new methods as a practical acquaintance with those already existing. However perfect a process may be on paper or in the hands of others we imagine that few of our readers would care about starting on a two or three weeks' tour working a process they had never tried, or having tried had failed to thoroughly master. Let the trial be made during the "dead season," and, having mastered the details of manipulation at home, when the campaign reopens the practical application may be made with some chance of success.

We shall now glance briefly at the various means available to our purpose, and shall then leave it in the hands of our readers to select whichever line of experiment they may prefer to adopt. We may consider two distinct lines of research—first, the methods which dispense entirely with glass; and, second, those which make temporary or partial use of it. In the first class are included the calotype, waxed paper, and other processes, in which the sensitive film is formed at once upon its final support; in the second class those in which the film is spread originally upon glass, and at a subsequent stage transferred to a more portable basis, or in which the flexible support is first made use of, glass being the final support. Each system has its special advantages, which will be noted as we proceed, while in point of convenience only it will frequently happen that one or other system will prove the best according to the immediate circumstances.

We commence with the first-mentioned and oldest process—the calotype or Talbotype. Beautiful though its results may be, we imagine few of our readers would be inclined nowadays seriously to meditate its adoption. Independently of its not being a dry process, the conditions necessary to its successful working are not such as would find favour in these dry-plate days, so we may dismiss it with a full acknowledgment of its claim to being *the* first step in the direction of practical landscape photography.

We come next to waxed paper, almost as old as calotype, and scarcely to be described as a definite process any more than we can at the present time speak of the "glass" process. Waxed paper has done good service in its day, but, like calotype, is scarcely up to modern requirements. By bringing our present knowledge to bear upon it doubtless it might yield good work as regards quality; but it could not, for obvious reasons, compete with other methods in point of rapidity. In order to secure in the highest degree the combination of sensitiveness and good keeping qualities alkaline development is a *sine quâ non*, and it happens, unfortunately, that this mode of development has a very strong tendency to produce stains upon paper, unless the pores of the latter are filled with some insoluble waterproof substance, so as to protect it from the action of the developer. Now, as in the waxed-paper processes the image is developed *in* the paper as well as on the surface, it must be peculiarly amenable to the abnormal action of the developer, and to prevent the stains we must at least partially stop development.

These remarks apply, of course, to waxed paper sensitised in a bath of silver; but by adopting a different course there is, we think, a greater probability of success. If plain waxed paper be coated with an emulsion, either washed or unwashed, the image is formed entirely on the surface, and the development may be conducted in such a manner as to confine its action to the collodion film without penetrating to any great extent into the paper. In this respect waxed paper offers a decided advantage over plain, as the semi-waterproof property conferred upon it by the wax assists in keeping out the developer; but even under the most favourable circumstances much greater care and more thorough washing are necessary than is the case with collodion on glass. It is better, when using an emulsion upon paper, that the latter be waxed previous to the application of the emulsion, rather than after the completion of the negative, as some prefer; because, in order to keep the emulsion film upon the surface, it is necessary that the pores of the paper be filled with some substance the collodion will not penetrate. If that substance be arrowroot, gelatine, or other sizing material, the subsequent washing is imperfect unless the size be first removed—an operation which, in addition to being troublesome, is likely to seriously endanger the safety of the negative film.

It is not, however, absolutely necessary that the paper should be waxed; if a good sample of paper be used, the amount of grain or texture shown in the print will be so slight as to be unnoticeable except in very small pictures, the only objection being the greater length of time required in printing. In order to produce results as far as possible free from granularity it is imperative that the emulsion be isolated, as it were, from the paper; if it be allowed to sink in, the picture will be formed partly *in* the paper, and any textural defects will be thereby greatly magnified. To attain this end it will be found requisite to give the paper an extra "sizing," the best material for the purpose being arrowroot; this should be made pretty thick, and must be squeezed through a double thickness of muslin to remove all lumps. When cold it is applied to the paper with a soft sponge, rubbing it in as smoothly as possible until the paper lies quite limp and flat. Any good photographic paper will be found suitable, Rives being perhaps the best, though Saxe is more readily obtainable unsalted. Failing a sample of unsalted Rives, we have obtained satisfactory results by washing the albumen and salts from ordinary albumenised paper, finishing by re-sizing it with arrowroot as described above.

Thus far we have only spoken of paper negatives pure and simple—that is, those which are intended to remain upon their original support. It is possible, however, to utilise the portability of the paper in taking the negative, and to transfer the picture subsequently to glass, in order to secure the highest state of perfection in printing. We shall deal with the various transfer methods in another article, as our space in the present number is about exhausted. From personal experience we can speak to the practicability of "emulsionised" paper, which, simple as it is, is capable of producing very high-class results, all that is necessary being a little steady work to familiarise us with its peculiarities.

THE LATEST IMPROVEMENT IN CARBON PRINTING.

Collodion has been used in connection with carbon printing in such varied forms as to render it difficult to pronounce at once upon the precise amount of importance to be attached to another and alleged new application of this substance. Very slight variations in its mode of application may, however, make a considerable difference in the results; and in this light we are pleased to see more methods brought into the field of practice, assured that if by the test of practice they prove to be valuable they will be generally adopted, while if they fail as respects utility they will come to nought.

This is our impression in introducing a new patent, entitled "Lambert's Improvements in the Production of Carbon and other Photographic Pictures." The patentee in this instance is not the French gentleman whose name is now so well known in connection with a particular kind of carbon print, but Mr. Henry Lambert, of Bath. When summarised the process is as follows:—A sheet of carbon tissue, previous to its being sensitised, receives a coating of a plain collodion containing a certain proportion of Canada balsam. This is allowed to set or become dry, after which the tissue is sensitised by immersion in a bath of a solution of bichromate of potash. When it is once more dry it is printed upon from a negative in the usual mode, and thereafter is immersed in hot water, and the development allowed to proceed without any other support than the balsamed collodion. The development being completed the pellicular print is first washed in a solution of alum, and is then, and while still wet, transferred to its final support, which the patentee prefers to be a white or tinted enamel card, made waterpoof by collodion or varnish and sized with gelatine, although opal, china, glass, paper, or other material may be used for this purpose.

Having thus stated in brief the nature of Mr. Lambert's invention, we now come to the details of the process; and in giving them we make use of the *ipsissima verba* of the patentee:—

"I take a piece of tissue on which a photographic picture is to be printed and coat it with a permanent transparent support in the following manner:—The tissue may either be made sensitive to light by being immersed in a bath of bichromate of potash or ammonia, as is well understood, before or after the permanent transparent support has been applied to it. In applying the said support I lay the sensitised or unsensitised tissue upon a flat surface, the face of the tissue being upwards. I take a piece of cardboard a little larger than the piece of tissue to be operated upon. I cut from the said cardboard a piece nearly equal in size to the piece of tissue, the cardboard from which the piece has been so cut constituting a flat frame. I gum one side of the inner edge of the cardboard frame to the extent of about one quarter of an inch, and then place it, together with the central piece which had been cut from it, upon the tissue, the gummed frame lying upon the marginal portions of the tissue, and the central piece of cardboard or that part which had been cut away from the cardboard frame lying upon the other portion of the tissue. The whole is exposed to pressure until the cardboard frame is firmly attached to the tissue. I then remove the central piece of cardboard, and the tissue with the cardboard frame gummed to its marginal portions constitute a very shallow trough into which I pour the permanent transparent and flexible support, the bottom of the said trough consisting of the surface of the tissue. When by the evaporation of the solvent the transparent flexible support has become dry or hardened the tissue is sensitised (if it has not been previously sensitised) by a solution of bichromate of potash or ammonia in the usual way. The cardboard frame which forms the sides of the shallow trough is cut away; that is, the bottom of the trough consisting of sensitised tissue coated with the transparent flexible support, is cut out of the cardboard frame, and may be cut up into the sizes required for printing. The printing on the said tissue is effected in the ordinary way from glass or other negatives. On removing the impressed tissue from the printing-frame I immerse it in warm water to which a little ammonia has been added (two drops of ordinary commercial solution of ammonia to twenty ounces of water answers very well), and develope the picture by the said warm water without any other support besides the permanent transparent support. When the development of the print is completed it is washed with a weak solution of alum, and I transfer it with its support to its final mount without waiting for the print to dry.

"In order to mount the print I take a piece of glass or white cardboard of larger size than the print, and I pass the said piece of glass or cardboard under the print immersed in the water. I lift the print out of the water on the said piece of glass or cardboard with its surface or developed side upwards, and I place it in a dish of clean water; but in doing so I invert it—that is, I turn the surface or developed side downwards—and let the print float off the glass or cardboard, the permanent transparent support being uppermost. I then take the final mount and pass it under the print in the water. I adjust the print to the required position on the mount, and then lift the said mount with the print upon it out of the water and allow it to dry on the mount. If the print when lifted out of the water does not lie quite flat on the mount it may be made to do so by gently passing a soft camel's-hair brush over it. The process is now completed, and the print is seen on the mount with its true or non-inverted aspect with either a glazed or dead surface, according to the kind of mount used. For the final mount or support I prefer white or tinted enamelled cardboard made waterproof on one side by clear varnish or normal collodion, or other transparent waterproofing material. I prefer to size with gelatine that side of the cardboard on which the print is to rest. I do not, however, limit myself to any particular method of mounting the print, as it may be mounted on various substances, such, for example, as opal, china, glass, paper, plaster of Paris, or ivory.

"The permanent transparent flexible support does not leave the tissue during sensitising or developing, or afterwards, but remains a permanent part of the finished picture. There is no danger of the blistering or reticulating of the tissue, which commonly occurs in the ordinary method of using it. It will thus be understood that I do not use any temporary support whatever during the developing and mounting of the print, such as is required in the ordinary method of developing carbon or permanent photographic pictures. It may, however, be sometimes convenient to pass a piece of glass or cardboard under the print during the course of development, in order that the development may be the better observed and stopped at the proper time. The use of a piece of glass or cardboard passed under the tissue in the water also facilitates the removal of the back or paper part of the tissue. But I wish it to be distinctly understood that these uses of glass or cardboard, although sometimes convenient, are not necessary to the practice of my invention, and that when glass or cardboard are used as described their function is in no respect analogous to that of the supports required in the ordinary method of developing carbon or permanent photographic pictures.

"When it is wished to have a dead or unglazed surface to the print I prepare an enamelled or white card by coating cardboard with collodion thickened to the required degree with zinc white or other permanent white pigment. The card covered with the pigmented collodion is allowed to dry. The print when mounted upon this card has a dead or unglazed surface. In place of zinc white, finely-ground starch may be added to the collodion with like effect.

"The permanent transparent flexible support hereinbefore referred to is composed as follows:—

Canada balsam	6 drachms.
Castor oil	1 ounce.
Turpentine varnish	1 ,,
Plain collodion	70 ounces.

These are mixed together and thoroughly incorporated by agitation, and when the mixture has cleared, either by subsidence or filtration through cotton wool, it is fit for use. If the tissue is to be made sensitive to light after the support has been applied to it, then the turpentine varnish must be omitted, the composition of the support remaining in other respects the same. I do not, however, limit myself to a permanent transparent flexible support of the above composition, but I have found the above composition to answer well in practice.

"Having now described the nature of my invention, and the manner in which the same is to be performed, I wish it to be understood that I do not limit myself to the precise details herein described, as the same may be varied without departing from the nature of my invention; but I claim as my invention the improvements in the production of carbon and other permanent photographic pictures hereinbefore described; that is to say, coating sensitised or unsensitised tissues used in the production of carbon and other permanent photographic pictures with a permanent flexible support on which the tissue is supported during the printing, developing, transferring, and mounting of the picture, whereby the temporary support ordinarily used is rendered unnecessary, and the production of the said carbon and other permanent photographic pictures much facilitated, substantially as described."

In noticing the special claim thus made, and in which lies the whole pith of the patent as a patent, it may not be out of place to remark that the use of a collodion film as a support for a carbon picture during development had been suggested by other experimentalists some considerable time back. This speciality, for example, was directly spoken of sixteen years ago by M. Ernest Lacan, our then Paris correspondent, who, in alluding to a process by M. Fargier that he had been describing (see the number of this Journal for June 15, 1861), says:—"The difficulty offered by the manipulation of a collodion film floating in a bath, and which must be, so to speak, fished out before it can be mounted on the sheet of paper, limits the application of this method, which cannot, in its present state, answer the requirements of printing on a large scale." We are quite well aware that the process of Fargier and that now described differ in several very important respects; but it is curious and a little unfortunate that the special claim made on behalf of the latter patent should bear so close a resemblance to what had been previously done. Again: in giving (September 9, 1870) a description of a new carbon process by Mr. William Firling, we made special allusion to the Fargier process in the following terms:—"As a double transfer process the coating of the gelatinous film with collodion *as a support during development*, and the subsequent floating of this film upon gelatinous or albumenised paper, was undoubtedly perfect, though the mechanical difficulty of handling the collodion film was so great as to limit its use to a few experts."

We have made these extracts with no desire to invalidate the patent, but only to show that the leading feature in the claim had long ago, and more than once, been recognised.

REFLECTORS *VERSUS* SCREENED WINDOWS.

Of all the replies we have to make to correspondents on the subject of lighting the model it could, perhaps, be proved that the advice "avoid cross lights" would predominate over everything else we wrote; indeed, this oft-repeated expression might be stereotyped ready for use. And, yet, a rigid adherence to the letter rather than the spirit of the rule would but lead to a mechanical mode of dealing with the illumination, for no argument is required to show the necessity of a careful disposition of blinds, screens, and reflectors for altering the character and direction of the light; but the professional photographer is frequently met with the remark from the ignorant among his clients—"that one side of the face is so black!"

The lighting generally preferred by a portrait painter for his sitter is a tolerably strong one, because, from a very restricted area, such as the top half of a good-sized window, deep and transparent, not black or heavy, shadows are obtained by this character of illumination, and they can be modified to any desired extent by the interposition on the near proximity of any coloured object which lends a portion of its tone to the carnations of the model. Such expedients, however, are practically out of the question for photographers; for the colours chosen to be reflected into the face may be, and most likely would be, just those which in photography would be devoid of action, and recourse must be had either to pure white, grey, or blue.

But there is, again, a still greater difference between the lighting needed for the painter's model and the photographer's. Thus, the former likes a clear, tolerably sharp-cut shadow which would fall by the side of the nostril, and again on the cheek, below the lips, &c. But to photograph a model so illuminated would result in a portrait forcible, it may be, but so wanting in the delicacy and gradation which form the charm of a photograph that its rejection would be ensured. To produce the effects he wishes the photographer opens a relatively large space of window—a dozen times as large as that the painter uses—and lights up the figure in the way he prefers, and, when suitably arranged, a soft and harmonius yet forcible effect is produced, large though the illuminating angle may be.

To study the effect of light upon a face an excellent method is to take a large white ball or globe and throw the light upon it from various angles and directions. This will enable the student to realise all the conditions his sitter is ever likely to be subjected to (but when the work of the retoucher comes in he must take the globe as an example to avoid for texture). Taking, now, the ball in the hand, or placing it upon a table, it will be seen that the side farthest from the light gradually appears darker and darker till near the edge, at which part it almost suddenly becomes lighter, a long, light strip bordering, as it were, the whole shadowed side; in fact, whatever solid object with curved or rounded surfaces be taken, it will be observed that its boundary edge will be lined upon the darkest side with a lighter tint. This lighter part is produced by the light from surrounding objects being received at such an angle that it is reflected into the eye, and hence the edge of a sphere, for instance, is just the place where the greater proportion of reflections would be received from, and the more strongly the adjacent objects be illuminated the more conspicuous will this reflected light appear. The same thing occurs when a sitter has a light dress or a white cap close upon the face; at times the reflection will produce a light which in effect equals that upon the illuminated side of the face, and unless great care and judgment be used an exceedingly flat appearance is produced.

So important is this effect of reflected light upon the edges of shadows that, if by any means the surroundings did not reflect any light, a painter would be almost sure to introduce some object that would have an effect upon the blackness of the shadows, though the need for any such intervention would rarely arise, so universally almost do objects reflect light. We think it likely that in the early days of photography the attempt to secure roundness and modelling by imitating the arts of the portrait painter may have led to the use of reflecting surfaces of greater power to produce the effect we speak of in the photograph itself, which would necessitate the use of special arrangements. All who see some of the earliest photographic attempts at portraiture would be struck by the heaviness of the shadows and their want of modelling, and it was not long ere the use of a reflector was recommended. As the art spread and portraits were taken in all sorts of places the original window illumination gave way to numerous kinds of lighting, regular and irregular, and the advice of the trained artist was soon called for to remedy the effects of such disregard of artistic canons as showed the existence of something wrong without at once indicating the cure to the untrained mind.

Prominent among these evils was the effect of cross lights upon the face. When rapidity in exposure began to be possible—rapidity, that is, in comparison with the earlier exposure of minutes against seconds—the aim was to obtain "quick" pictures; all the light it was possible to make use of was employed, with results not very artistic, but which yet, in the old collodion days, were little observed, for the beautiful delicacy of the image of a well-taken collodion positive led the mind away from other shortcomings. But when paper pictures became common more artistic feeling had to be displayed, and it was found that a return to a system more like the portrait painter's gave results of greater excellence, and then studio lights were covered over, and reflectors made their appearance.

Happily at the present time artistic culture is not so rare among photographers as it was; but for many years art, in many instances, was merely aimed at by the adherence to arbitrary rule and canons which were supposed by many to be unalterable. And foremost among these was "avoid cross lights"—a most useful and important dictum in its way, but not to be followed to the letter under all circumstances; for we ought not to need to observe that a light which is reflected has for this purpose no different qualities whatever from a light which comes direct from the sky (for, strictly speaking, the latter also is reflected; but we allude, of course, to reflectors inside the studio). No doubt the light from portable reflectors is usually much more subdued of necessity, and, indeed, of set purpose, than that from a window; and it is from this circumstance that the idea we indicate, and which certainly has a decided existence, has arisen.

Having thus indicated that there is no essential difference between a reflected and a direct light, the inference is obvious that a direct light received through a window, if reduced sufficiently and its area be under due control, would answer every purpose of a reflector, and such is the case. But practically there are found so many conditions under which reflectors are most useful that we should have some difficulty in pointing out a studio where, granting a double light does exist (and this, through the action of other prejudices, is not very common), the dark side windows are used for lightening up the heaviness of shadows. There is not any reason why this should be so; but, of course, care would require to be taken that the light admitted was sufficiently toned down to avoid the production of shadows on the illuminated side.

The use of the windows for this purpose, too, would offer many advantages from the varying directions in which the modifying light could be sent; while with reflectors—whether of the movable-screen kind or from white-painted walls—the range is much more modified in degree. There is one direction in which a reflector cannot be superseded, and that is when it is placed on the floor in front, or to one side, of the sitter; but here its special advantages may be said to cease, and with this exception we leave the matter in the hands of photographers, feeling assured that the use of properly-modified side-lights in the shadowed side would increase the capabilities of any studio.

THE PHOTOGRAPHIC EXHIBITION.

[Second Notice.]

We have spoken of the number and variety of pictures by dry processes that are exhibited. The qualities displayed in many of these photographs are such as ought to, and probably will, have an influence on the mind of the professional "portrait taker," who in innumerable instances does not appear to be acquainted with the mysteries of dry plates and pyro. development. In addition to the choice selection of works by Mr. England there are several examples of "dry" work by the Royal Engineers' School of Photography, among whose exhibits there are, both by the wet as well as dry processes, many admirable pictures.

Mr. Baynham Jones is a faithful adherent to dry-plate photography, coffee and albumen being practised by him with excellent results.

Mr. Beasley, both in his "Fothergill" and "Liverpool" processes, shows that he is still the same careful photographer as in former years.

Mr. W. Wainwright favours Kennett's gelatine with good effect, while in the "Liverpool" plates Mr. W. J. A. Grant finds a means for bringing from the Arctic regions scenes peculiar to those frigid latitudes.

In the "dry" school is also Mr. Vaughan, whose contributions, however, like some of the others mentioned, are not confined to dry alone, as No. 70 and other works testify.

The "beer" process finds in Mr. R. Keene a clever exponent, who shows four charming examples of work done by that process. Mr. W. Widger "goes in" with effect for albumen, beer, and coffee plates.

Mr. J. C. Stenning, in his *Interior of a Fernery* (249) and five other pictures, shows in an excellent manner the capabilities of gelatine pellicle. Mr. Reuben Mitchell, in several landscapes of large dimensions and fine quality, proves his command of a good dry process—*which* process is not said. Mr. A. E. Durham exhibits nine pictures by the emulsion process. A smaller number is contributed by Mr. J. D. Radcliffe, who ought to do some works on a more imposing scale. It is not much more difficult to prepare and develope moderately large than small pictures. Of a number of views taken by Dr. Huggins, F.R.S., during a tour in Normandy (507), we may say that, while not technically perfect and being of small dimensions, they will form interesting mementoes of the tour. The frame (504) of views by Mr. P. Mawdsley contains many exquisite pictures, the careful study of which will repay attention. We need scarcely say that they were taken by the now popular Liverpool emulsion process.

Of the contributions of Mr. M. Whiting some views in Surrey are of a more attractive character than his views in Italy, *The Ford, Gomshall*, being an excellent example of the latter. Kennett's pellicle has done admirable service in 532—a frame containing several portraits and groups of Cape Kaffirs, by M. Kish, who, in these pictures, shows the great value of sensitive dry plates to the traveller. Mr. G. S. Penny also exhibits a variety of pleasing views taken by the same agent. To the frame of pictures (399) exhibited by Mr. Herbert B. Berkeley we turn with interest, knowing that they are the work of a gentleman possessing fine artistic taste as well as ranking among the foremost experimentalists of the present day. His pictures evince great manipulative care, combined with those artistic qualities which constitute works of art. Mr. J. W. Penfold, Rev. W.

E. Hancock, Major-General Knox, Mr. J. Henry Whitehouse, and Mr. W. Brooks also exhibit excellent examples of dry-plate work.

Remembering the numerous admirable pictures exhibited in former years by Mr. Robert Crawshay, we see with a feeling of disappointment that his contributions of really enjoyable pictorial landscape this year are numerically far below what might be desired. The Breconshire volunteers are doubtless an admirable body of men, whether viewed in whole or in part, and Mr. Crawshay has in his several photographs of this contingent of our reserved forces done them most ample justice; but we should have preferred his giving us more of those charming landscape delineations in the representation of which he has proved himself to be a skilful artist. *Dany Craig* (38) and *Lanvaes, Brecon* (39), however, prove that Mr. Crawshay is not quite unrepresented as a high-class landscapist. Some capital groups, other than "volunteers," on the screen, show Mr. Crawshay in a new aspect.

The views by Mr. Bowness are exceedingly fine, Nos. 3 and 4 being good examples of this artist's work. Mr. S. Fry's picture, *The Taxidermist* (335) challenges attention from its merits as well as from a medal having been awarded to it at the Edinburgh Photographic Society's exhibition. Mr. Fry's other contributions are a fine portrait (324), a composition picture, *The Fisherman*, and a frame of children's portraits (499), which are very attractive.

The only picture exhibited by Mr. H. P. Robinson is a work of undoubted merit. It is entitled *When the Day's Work is Done* (281), and represents an aged couple seated at a table—the woman knitting and the man reading the Bible. With a little more unyielding sternness, in addition to a *soupçon* of dogmatism displayed in the face of the venerable bible reader, he would have made no bad representation of the old, uncompromising Scottish covenanter. Every part of the composition seems to have been carefully thought out, and the picture must, on the whole, be pronounced as the best, or certainly as amongst the best, that Mr. Robinson has yet produced.

Of a different nature is Mr. Slingsby's picture *Alone* (327), in which a pleasant-looking young lady is seated on a sloping bank near the seashore. This is unquestionably the finest picture that Mr. Slingsby has exhibited for several years.

Mr. George Nesbitt has achieved such a good reputation for pictures contributed in previous years that we look for something unusually excellent from his camera. Nor are we disappointed. In *Tired Companions* (241) we have a fine picture, representing a child seeking repose with its head pillowed on the side of a noble dog. His *Fortune Teller* (242) and other works also possess a high degree of merit.

In an article on gelatine bromide in our last number Mr. G. Morton speaks of the beneficial effects of sugar or treacle upon gelatine emulsion when applied to the pellicle as an organifier. We are able fully to corroborate Mr. Morton's estimate of the value of saccharine substances when so employed; but, if we understand him rightly, we think he attributes the result to a wrong cause. An increase of density we could, under certain circumstances, easily believe to accrue from a course of treatment rendering the film "more penetrable to the developer;" but the connection between cause and effect in the cases of the other improvements mentioned is not so apparent. Here we may ask the question—*Does* the addition of saccharine or other matter to the gelatine increase its penetrability? Considering the ready affinity of gelatine for water we are inclined to look upon such additions for the purpose named as entirely supererogatory. In the case of a collodion film, which is much less permeable to water than gelatine, we could understand such an action; but it is a fact that the identical effects described by Mr. Morton as ensuing with gelatine are also obtained with collodion, and that after the saccharine matter has been completely removed from the film previous to desiccation. This entirely disposes of the supposition that the result is due to an increased permeability of the film. We think all the phenomena mentioned are to be traced to the peculiar organifying and restraining power of the sugars, which would sufficiently explain the greater brightness and clearness of the negative, as well as the increased latitude in the matter of exposure. As regards the density, it is well known that a film containing, or which has been submitted to the action of, a restrainer, so as to lessen its fogging tendencies, is more easily intensified than one which has not undergone such treatment. Cane sugar exerts this restraining influence with a minimum of retarding action upon rapidity, but golden syrup or treacle will be found much more energetic both in restraining fog and retarding development. Whether they produce a corresponding effect upon the density of the developed image we are unable to say.

THE ART OF PAINTING ON THE PHOTOGRAPHIC IMAGE.

No. VIII.

As the matter applies to all kinds of painting I may as well here touch on the amount of improvement allowable in painting a face. Thanks to photography I think a healthier idea of what a portrait should be is commoner with the public than it was even ten or fifteen years ago; still there are things in a photograph usually that admit of alteration for the better.

The shadows under the eyes will often be found too dark, and must be lightened (not removed altogether) with orange chrome and white. The shadow round the wing of the nose is often too strong, and gives a supercilious expression. The line from the corner of the mouth to the nose is generally too strong; also the one running downwards from the corner of the mouth. The dark shadows at the corners of the mouth are often so black and large as to make the mouth look as if it were longer than it really is. These shadows should be lightened and the real corner of the mouth marked in, crisp and dark, and with a tendency upwards, if anything; also the whole space between the upper lip and the nose will usually bear tinting with a little grey. It is usually too white, and gives a sulky look.

In painting in water colours on plain paper very much the same colours will do as for autotype or albumenised paper, excepting that the image being lighter you will not require to use so much orange on the deep shadows. Rubens' madder will generally be found to answer.

In painting vignettes neutral tint with a dash of Indian yellow makes a pretty colour for the background, the form of which is of the greatest importance. It should partake of a cloudy character; but the same rule applies as in a curtain—it must not repeat the outline of the figure, nor must it be a plain oval, as if the figure were sitting in an egg. It must be broken up into a jagged edge—not a repetition of the same curve over and over again, all round, but some of the points round and some square in character, and of different sizes. I am particular in mentioning this because I so often see vignettes suffering from these defects. It should be finished off with a soft, broad cross-hatch. There is a great art also in finishing off the drapery of a vignette. The lines and shadows should be sketchily prolonged, and that part of the body coming next after the vignetting dimly suggested with a few dashing strokes of the brush.

There is much greater facility for getting a nice, sketchy effect on plain salted than on albumenised paper, and that has led some artists to take an albumenised print of the head, cutting it carefully out, rather *within* than *outside* of the hair, paring the edges into a bevel at the back, and gluing it on to a piece of plain paper or drawing-paper sufficiently large to admit of a body or part of a body being sketched to it. A landscape or panelled background can also be easily introduced by a good draughtsman, and the effect is really very charming. Of course it can be done on any tint of paper. Bits of ivory are also let in with photographs of the head and hands on a similar principle; only the ivory is so thick that a hole of exactly the same size and shape has to be cut and the ivory let in.

There are two distinct methods of painting on a photograph in oil, answering somewhat to tinting and highly finishing in water colour. One is by doing as much as possible with glazes of colour largely diluted with medium; and the other is like the ordinary painting in oil, the effect being very similar. I will describe the former method first, as it is the easiest; but it will only answer on good photographs.

If an autotype be used you may commence on it at once, and the colours will bear out on it most brilliantly, and not sink in the least—no small advantage. The mess and trouble of sizing an albumenised silver print is often very annoying, and proves a great waste of time; but it is absolutely necessary. A hot, thin solution of Nelson's gelatine with a little powdered alum is good. JOSEPH WAKE.

A DAY IN THE RECEPTION ROOM OF A COUNTRY PHOTOGRAPHER.

SATURDAY, and market day, and, if anything more were necessary to complete the introduction, I may further add that it is fair day.

"Well, and why so particular an account of the 'day?'" it may be asked. Just because these three circumstances combine to make *this* day very different to all others in the weekly calendar; for you must know I am the "colourist," whose duties confine me to the corner of the reception-room, where I am supposed to be guarded from the gaze of the vulgar crowd by a folding-screen. Said screen rather serves to draw observation; for it is a well-known fact that whatever you desire to make public you should be sure to enclose behind a screen, as the present descendants of our common mother still inherit her peculiar tendency for making discoveries.

It is 9 a.m., and I am comfortably seated—palette, brushes, &c., all in readiness, as ours is a different trade to that carried on in a London establishment. *Our* patrons often prefer to take away their own photographs rather than to have them "sent home." It often happens that when he or she receives his or her packet it only requires a very small amount of pressing to have one coloured—"we do it for a shilling"—ere they consent, and I have to set to work at once and do it "while they wait," as the phrase goes.

Was that a footstep? Not much need to ask; here it comes—tramp, tramp, in heavy, clouted shoes. A tall, red-headed son of Anak stands awkwardly in the doorway, regarding very dubiously the brightly-carpeted room, as compared with his own muddy condition, for it rains as usual. The young lady assistant approaches. "Haugh! do you take picturs here, mum?"—"Yes, sir; will you walk in?" So in he comes, as I am made fully aware by the vibration of my table.

All preliminaries having been settled, the question is put—"Would you like one coloured, sir?"—"Don't care much about it; what's the charge?" He is informed. "Well, the old woman will like it; so I s'pose I may as well."

He is introduced to me, and, armed with notebook and pencil, I politely request him to remove his hat, and turn more to the light, which he does, the colour rising, meanwhile, to the extreme edge of his shirt collar, in consequence of the close inspection of "the lady."

He is next taken in charge by the aforesaid young lady, and generally "put to rights" in regard to his wearing apparel ere he is finally dismissed to the operator. Query: how will he "pose" that rough-looking giant artistically?

A confused sound of chatter and merry laughter, with a general bustle on the staircase, announces a "group." Enter mother, two blooming red-cheeked Hebes of daughters, a sheepish-looking son, and "father." How the tongues rattle! how the girls giggle! how the son tries to stare unconcernedly at the portraits of past sitters which decorate the walls like pictured ghosts of the departed!

They all retire to the dressing-room, whence there presently issues a strong odour of "washing-day," and when they come forth their cheeks shine, like Aunt Chloe's children, with cleanliness.

Thank goodness! there's the operator's bell, and *they* are gone. One feels as if a steam-engine were suddenly brought to a full stop in the room.

Ten minutes' peace, when a shrill cry announces another "sitter" or "sitters," for these are plural, comprising a mother, baby, little boy, and aunt.

"The baby is to be taken?"—Oh, yes! and this little boy, please."

There the latter stands, the very personification of sullenness. It wears off, however, in time, and he takes a tour round the room.

"Come here, Fred!" Fred does not "come here;" but, instead of so doing, he is filled with martial ardour, and runs full tilt at the screen, which, not being very strongly fortified in anticipation of such an assault, is overturned on my unfortunate head with a crash. Then follows confusion, in the midst of which the operator is ready, and Fred is carried off, howling, from his maternal chastisement, to have his portrait "taken." What the operator does to restore the usual "pleasant expression" is more than I can say.

And so the hours wear on. Sitter follows sitter in rapid succession, of all degrees of nervousness and of all grades and stations, from the wealthy owner of property in the town to the common labourer who has just managed to scrape together the few necessary shillings.

One o'clock draws near, and there is a lull for a few minutes. Not long, however, are we left in peace; for a bumptious shop-assistant and clerk combined thinks he will devote part of his dinner-hour to having his portrait taken, so steps in accordingly. When apprised that the operator has gone to *his* dinner he waxes highly indignant, and pointing to the notice he had received at the door—"Portraits taken from 9 till dusk"—demands, "What does this mean, then?" in stentorian tones.

He is politely informed that all animals require sustenance; that he will not have long to wait, as Mr. So-and-so is very punctual. Whereat he lowers his tone, but grumbles about the hardship of losing his time. But soon he loses a little more of his remaining stock of patience. He rises and paces the room like a caged lion. Each stride brings him nearer to my table, and, looking up, I am conscious of his angry visage intently regarding my operations over the top of the screen in the pauses of his walk. How he shakes the room and table! Will the operator never come?

There's two o'clock at last, and he has gone to be "posed." I hope he will prove a "difficult" sitter, and get well punished accordingly. In half-an-hour he emerges—his face redder by several degrees than it was before—and one glance shows me he has failed to "sit still."

Good gracious! the creature will have one coloured! What mixture of pigments will produce the tints of that complexion? With a sigh of relief we hear the echo of his noisy footsteps down the stairs, and devoutly hope that there will be no second edition to-day.

Who next? Their name is legion. Here they come! Marketing is finished, and their remains nothing more to be done but to enjoy themselves ere the train start for home. So they bring babies, baskets and all, until the room is presently filled to overflowing, and the stairs are lined with "standers" ycleped "sitters."

What a babel of voices! except from that quiet cluster in the corner, who, dressed in deep mourning, surround a fragile-looking old lady, evidently just "left behind" by some dear one "gone before," and who is come owing to the solicitations of her children that they may secure a likeness of their sole remaining parent. *They* are quiet enough.

As sunset approaches visitors fall off a little, and gradually peace and quiet settle down with the increasing darkness. What's that? Another! He is rough enough.

"Well, my man! What is it?"—"I want my likeness taken, please mum."

"I am sorry—you're too late; the operator has just gone."

"The who?" "The operator—the gentleman who takes the pictures."

"And can't I have it done? Ain't there nobody else to do it?"—"No, besides it's too dark. You must come another day."

So he takes his sorrowful way down-stairs again, much disappointed. And thus ends our day in a reception-room.

COLOURIST.

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ON THINGS IN GENERAL.

THE great event has happened! The pictures are hung, and the whole affair of the opening may be considered a success. It is of the Exhibition of the Photographic Society of Great Britain I am, of course, speaking, and its *conversazione*. No more sartorial discussions, but every one came as he liked straight from the prandial mahogany with swallow-tail and choker, or direct from his lounge at his club in morning dress, which it is well known means a suit of black in this country, or so it would appear to be from the prevalence of that sober hue on the gay occasion.

But *place aux dames!* Before treating of the photographic pictures let me speak of them, and thank them for the charm their presence lent to the imposing scene. Our Editors say "several" ladies graced the meeting by their presence. Fie! what do they mean? I aver they were in such number that the contemplation of the fair perambulating pictures left me far less time than I ought to have had for the study of the pictures on the walls. But the Editors will have their say on the latter subject in their leading article, whence I extract their comment on the feminine element of the *conversazione*. They give an excellent *résumé* of the objects that first arrest one's attention. I admire the delicate way in which they avoid hurting anyone's feelings, when, for instance, they criticise the burnt-in pictures as "of a character unlikely to prove generally acceptable." Decidedly unacceptable, I call them. I do not know what they were there for at all.

But the array of pictures, as a whole, is excellent—superior, I believe, to most, if not all, previous displays. It is striking what a change has gradually been made in the class of work exhibited, artistic feeling being more common by far than it was within even but a few years. But no less conspicuous a change may be noted among the photographers themselves. Formerly, to start photography usually meant that failure had been sustained in some other walk of life, or that ambition stirred within the breast of the new man—he had determined to break from the trammels of shoe-blacking, whitewashing, or crossing sweeping, and with his hoarded shillings possess himself of a camera and become an artist. And we know that, taking them as a whole, the body of photographers in those days, while boasting the presence among them of some of the best and most honourable men in existence, had also a larger sprinkling of knaves and black sheep generally than many another trade or profession. What tales the wholesale dealers could tell if they would! Fortunately, however, the ranks of our art now are recruited from a different class, and we have among us many men of trained talent, and many who are gentlemen; but it is evident that even yet we are not free from either blacklegs or black——. I noticed with some surprise the other day that our Editors had mightly increased the self-importance of the editor of a contemporary—whose pages remind me of my old grandmother's patchwork quilt, which was the labour of her life, poor old body!—by deigning to notice his drowsy periodical. Truly, they did what courteous journalists might have been expected to do under ordinary circumstances; but surely they were aware whom they were addressing. However, they afforded him the opportunity of behaving as a gentleman, of which I need not say he did not avail himself, but replied in return in his characteristic style. There the matter should have rested, and his words allowed to be his own rebuke; but, annoyed at their error, I suppose, they gave him such a castigation that his literary writhings were most painful to look upon last week. I hope that is the end of the matter; for, from my youth, I never liked to see pain inflicted. I never could bear to look at the impalement upon a pin of even the meanest of insects, as is the wont of boykind.

I have wandered from my topic of the Exhibition, which I hope every year may find improving; for this, our art of photography, is an important feature in the great story of human life. Denied a place among fine arts by the artists, it yet yearly proves its just claim to one. Only the other day I read in the pages of a contemporary of an artist wishing to "ingratiate himself with a photographer." That shows how we are improving in our position.

But not only in artistic but in technical directions do we progress. At last we are to have a reduction of one-half in our exposures. I see the names of well-known London photographers appended to M. Scotellari's advertisement, stating they find a reduction in time of one-half by the use of his process. It is true that not long ago it was stated that the name of a well-known continental artist appended similarly was merely that of his clerk's; but here are the imposing names of men who know, and hence the process must be all right and cheap at the money. I have not, however, heard of its uniform adoption in those gentlemen's studios.

Photographers are connected by many ties with painters in oils. The latter paint from and on our pictures, they copy them without acknowledgment, and altogether find us a useful lot of people. But the middlemen and the dealers are to be looked upon with cautious eyes. I read the other day that mechanically-produced pictures—copies by printing in colours—were palmed off as originals after being worked upon. The method recommended to detect them is, in case of suspicion, to take them out of their frames and *chip off a corner of the picture.* Imagine a possessor of a veritable old master allowing every casual caller in to unframe a picture and start picking it to pieces, beginning at the corners! I think that if such a picture were mine no sacrilegious finger would be allowed to touch it in this manner.

There has been a considerable amount of correspondence lately on various business topics. One gentleman's logic particularly stuns me. Writing about a company whom he was endeavouring to speak his best for, he states that £2,000 is not the value to be paid; the latter is to be paid wholly in shares. As I have not noticed that in the stock market the shares are at a premium, it follows that the shares not being in value equal to the sum named must be worth less than their nominal value. Not a very good way of recommending a company, I should think!

Again, for want of precision, I must take exception to a gentleman who gives the specific gravity of a sample of spirit to the second place of decimals, but entirely omits any allusion to the temperature—an omission which renders valueless all such delicate niceties as twentieths of a grain weight.

Let me finish by calling attention to the latest cure for blisters—dipping the prints into muriatic acid before fixing. Here is sulphuring with a vengeance! Free Lance.

OPINIONS OF THE LONDON DAILY AND WEEKLY PRESS ON THE PHOTOGRAPHIC EXHIBITION.

The Photographic Society.—The annual exhibition of the Photographic Society of Great Britain, now on view in Pall-mall East, affords incontestable evidence of the state of perfection to which photography has reached. It was only the other day we recorded the death of Mr. Henry Fox Talbot, who discovered the secret of what was vainly attempted to be familiarised under the name of "Talbotype," but which we know as photography. Thus, within the limits of a generation, or at least of a single lifetime, the process which Mr. Talbot discovered and elaborated has developed into one of the fine arts. In the work of development in the direction of artistic perfection the Photographic Society of Great Britain have done distinguished service. They stand to photographic artists in the same position as the Royal Academy stands towards the painters. Like the great association which has its head-quarters a little further west, the Photographic Society have their committee of selection, and a footnote to the catalogue, expressing regret that "limited space" has prevented them from hanging a large number of proffered pictures, has quite a familiar look about it. In spite of these rejections there are nearly 600 photographs exhibited, dealing with subjects of all classes. Many of the exhibitors are amateurs, amongst the list being the familiar name of Colonel Stuart Wortley, who shows a series of studies of wave and cloud. The Royal Engineers' School of Photography are liberal contributors, and the Woodbury Company and the Autotype Company take advantage of the opportunity of bringing their special processes under the notice of the public. But, perhaps, the most interesting section of the exhibition is that devoted to the photographs taken during the Arctic expedition, and lent by the Lords of the Admiralty. Of these there are 107, and they constitute a unique pictorial record of the expedition. There is a fine photograph of the expedition at anchor in the harbour of Disco, showing the *Alert*, the *Discovery*, and the *Valorous*, with their withers as yet unwrung by the grip of the Arctic iceberg. Further on, we have the *Discovery* fast in the ice at Cape York, with a group of native dogs and sledges in the foreground. Then there is the *Alert* beset in Hayes Sound, on what was to us a summer night in August two years ago. There is a picture of the smithy and theatre knocked up at the winter quarters of the *Discovery;* another of a sledge journey, with a party from the *Discovery* going to make an afternoon call on their comrades of the *Alert*, and lunching midway on an ice floe. The various processes of "cutting out" are shown, and there is an interesting view of the post-office cairn at the *Discovery's* winter quarters—an establishment built with the rifled preserved meat tins. The expedition were fortunate in having amongst their number a gentleman capable of taking these photographs, and the Photographic Society are not less to be congratulated on being furnished with the opportunity of exhibiting them to the public.—*Daily News.*

Photographic Exhibition.—The annual Exhibition in connection with the Photographic Society of Great Britain, which is now open at the well-lighted room of the Society of Painters in Water-colours, 5a, Pall-mall East, is, perhaps, the largest ever held under the same auspices. It comprises over 550 frames, besides stereoscopes, albums, lantern-slides, *facsimiles* of ancient manuscripts, and a variety of photographs taken during the Arctic expedition of Sir George Nares, which are lent by the Lords of the Admiralty. To the practical photographer the exhibition is one of the greatest interest, affording as it does a complete review of the various developments of sun painting up to the most recent period; while to the connoisseur and lover of the beautiful, as exemplified in monochromatic art, it affords a treat of the highest order. There are, however, no startlingly new processes upon which to dwell—no surprises such as have awaited the visitor on some preceding occasions. The tendency of late years has undoubtedly been towards greater perfection in already-discovered processes—towards completeness and refinement, in fact; and so long as scientific efforts are put forth in this direction there is reason to believe that much may still be accomplished with the materials at hand towards elevating the art of the photographer. Year by year the uninitiated observer of these interesting exhibitions finds greater difficulty in selecting works for special mention, the performances being more uniform in quality. Formerly the productious of some half-dozen exhibitors stood out, as it were, in bold relief from the surrounding works of mediocrity; but now, owing probably to the larger field of selection offered the committee, or to a more rigid exclusion of commonplaces, merit in varying degrees is conspicuous at every turn, and throughout the entire collection it would be a task of no small difficulty to single out examples that should have been relegated to the limbo of the rejected. In portraiture the studies of Schweiz Tæschler are entitled to prominent notice. They are chiefly full lengths, charmingly posed and judiciously lighted. Some of them are carbon printed, and present the appearance of exquisitely-finished mezzotints. Schulz and Suck, of Carlsruhe, also contribute some artistic portraits by the carbon and silver processes; and the portraits by Bernard Mischewski, of Dantzic, are beautiful specimens. It is noticeable that photography pure and simple and photography "touched" by the artist are getting further and further apart, and it is not easy for anyone who is not an expert to tell where the one ends and the other begins. The question is whether this "touching" business is not getting rather overdone. It undoubtedly improves the raw material of the photograph, especially in flesh tinting; but if this working up by the artist is to go on, the word "photograph" will not correctly describe the art. Amongst the British exhibitors, Valentine Blanchard's *Study of an Old Man* is worthy of the highest commendation, being thoroughly lifelike and expressive, and the same may be said of Mr. Blanchard's portraits, of which there seem to be fewer examples than usual. The style of portraiture on porcelain exhibited by Lombardi and Co. is highly finished, with a miniature-like softness, very suitable for ladies and children, but hardly likely to bring out in sufficient relief the coarser elements of life. The specimens, however, are essentially artistic, and of their kind have never been surpassed. G. Nesbitt, of Bournemouth, also exhibits some good portrait studies and *genre* subjects, amongst the latter being *Tired*

Companions, a child lying on the floor with a mastiff, the freedom of which is worthy of all praise. A glance at the subject pieces is sufficient to show that photographers fail as a rule in posing their figures, or, it may be, the sitters fail to meet the operator's requirements. Whatever may be the cause, there is in most of the *genre* studies a manifest consciousness on the part of the sitter that he or she is a sitter. The idea, the episode, the story sought to be empainted is good enough, but the fixed result comes out transparent and hollow. That smile is an evident feint, or that look of surprise, contempt, or concern is clearly "put on" and unreal. This is the fault of photographic *genre* in nine cases out of ten. It may be seen in this room in a number of examples which need not be specified. Mr. Nesbitt, however, has avoided this fault, and his *Tired Companions* in particular is cited as an excellent production. Entitled to similar praise is the *Cross Purposes*, by Edwin Cocking, a perfectly natural scene from *The Happy Pair*. *Alone*, a young lady seated by the sea-shore with a basket of wild flowers, by R. Slingsby, of Lincoln, has some commendable features, the figure and accessories being admirably reproduced. Harry Pointer, of Brighton, contributes some funny cat and dog studies from life; A. Boucher, another Brightonian, is represented by some good portraits and figure subjects; while E. Fox, of the same town, is content to send a couple of his outdoor studies. The Autotype Company and the Woodbury Company are, as usual, largely represented. Their carbon enlargements are wonderful examples of photography. Their prints in permanent pigments, enlargements from negatives, copies from paintings, and other mechanical printing processes are exceedingly beautiful developments of the art. The Woodbury Company exhibit specimens of surface printing from metal plates, and the Autotype Company show their enlargements from *cartes* by the auto-mechanical printing process. Amongst other noteworthy exhibits is a frame of photo-etchings by F. Gutekunst, of Philadelphia, the etching being executed upon the film with a steel point. The black lines of the etching are distinctly visible on the foliage, drapery of the figures, and other details, but the flesh is left in its original state. At first sight the photo-etchings has the appearance of a double printing. Colonel H. Stuart Wortley contributes several frames of sea and cloud studies, snatches of Nature in her most evanescent moods; and the Royal Engineers' School of Photography, Chatham, is represented by a variety of landscape views, some of which are highly commendable. It may be remarked generally that the landscape studies are quite up to the usual standard of excellence. The Arctic expedition photographs are interesting, but from an artistic standpoint lay no claim to special notice.—*Morning Advertiser.*

The Photographic Exhibition.—Photographers may fairly be congratulated on the very excellent collection of photographs which was opened to the public on Wednesday at the Gallery, 5a, Pall Mall East. While the absence of colour gives to the walls a somewhat sober appearance, any shortcoming in this respect is fully atoned for by the evidence of care and study which an examination of the various works reveals. It is certainly pleasing to find that photographers are profiting by experience, and as they gradually learn to feel where their real strength lies so will improvement be evident. Not many years ago the tendency was to aim at photographs of large size—not by means of enlargement, but direct from the camera—and the result was the production of monstrosities perfectly appalling after the first sensation of wonder had worn off. There was also a period when what was termed "softness" was the "be all" and "end all" of photographic art, and Mrs. Cameron, praised as she was by artists—and in many instances deservedly so—out-Heroded Herod with distorted portraits with woolly outlines and exaggerated features. We have had a "composition" mania, where the artist, by means of half a dozen negatives, pieced together a picture which in some cases was effective, but as a general rule absurd and incongruous; and, lastly, there has been a time when photography was almost lost sight of altogether, and the pencil substituted so as to "improve" the negatives, and, through it, the human face divine. Indeed, to such an extent has this been carried that in several instances nature literally has been beautified completely away. Bearing these facts in mind, it is gratifying to find that the collection of the present year contains less examples of "vaulting ambition" than any previous exhibition which we can call to mind. At the same time, it must be admitted that there is still a good deal of ugliness which one would like to see reduced. What satisfaction can a representation of a commonplace countenance give to anybody, no matter how perfect the manipulation of the photograph may be? Or, turning to more ambitious work, what interest does any one feel in a picture, when the story told—if story it can be termed—is without point, and the models not only wooden in expression but positively repulsive? We forbear picking out examples of this kind of thing in the present exhibition, but would point to what can be done with simple materials in the opposite direction. Mr. Faulkner's pictures of children, for instance, are the perfection of good taste and artistic treatment; while, for simplicity and breadth, the *Study of an Old Man* (No. 275), by Mr. Valentine Blanchard, of Regent-street, could not well be surpassed. Of course it may be said that these gentlemen owed their success to their good models. Probably; but as we have simply to look at the result, with that we have nothing to do. Coming very near to the standard we have laid down is Mr. R. Slingsby's *Alone*. This is really a beautiful picture, and one feels an absolute pleasure in looking at it. The large composition picture of Mr. H. P. Robinson, Tunbridge Wells, will attract attention, and is undoubtedly a clever piece of work, the management of light and shade being both effective and artistic. But the two figures!—was it worth while spending so much time and ingenuity over them? Of the few foreign specimens the work of Feilner and of Klary pleases us best. M. Klary's are chiefly examples of Algerine life, and are extremely interesting. Delicate and yet forcible, the specimens of American work set an example which our artists would do well to follow—at all events, in a commercial sense. America, however, is not represented in the exhibition to any large extent. With the examples of landscape work it is not so easy to find fault. There are indeed some beautiful specimens, and the best to our taste is the small sizes. The productions of Mr. Matthew Whiting, of Lavender Hill, and of Mr. Peter Mawdsley, of St. John's Hill, Wandsworth, are perfect of their kind, and in the same direction are those of Mr. Frank Howard (South Lambeth). The latter gentleman's work, however, is spoilt through an extreme coldness of tone. Mr. W. England, Mr. Payne Jennings, Mr. Bowness, the Royal Engineers' School of Photography, and Lieut.-Colonel Wortley, all show exceedingly fine pictures; and interesting also are the Arctic views by Mr. W. J. A. Grant, who accompanied the recent expedition. South London, we may say, is well represented. In addition to the names already mentioned, Mr. S. Fry (Surbiton) has a clever picture, entitled *The Taxidermist*, which would have been better had not the figure of its small size the appearance of being overwhelmed by its surroundings. Mr. H. Garrett Cocking (Lee and Sydenham) shows a very good representation of the interior of St. James's, Hatcham, but scarcely does himself justice in his other contributions. Mr. Edwin Cocking (Queen's-road, Peckham) exhibits a clever *genre* picture, and Mr. W. Brooks has some good views of Reigate and its neighbourhood. Mr. W. Cobb's studies are technically good, but otherwise uninteresting. Mr. J. W. Edwards, Albany-road, Camberwell, exhibits some copies of statuary; Mr. R. V. Harman (Bromley) studies of animal and Kentish scenery; Mr. H. Baden Pritchard a picture entitled *Waiting to Go On;* Mr. J. C. Stenning (Beckenham) the interior of a fernery; and Mr. Leon Warnerke, of Peckham Rye, some specimens of photo-engraving and experiments in enlargement. Last, but not least, are the exquisite specimens of carbon printing by the Autotype Company and the Woodbury Company. The surface-printing of the latter is absolutely perfect, and opens up a wide field of speculation as to the possibilities of the photographic art. On the whole, the exhibition is well worthy of a visit.—*South London Press.*

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FOREIGN NOTES AND NEWS.

Harsh Lights in Carbon Prints.—The Decomposition of Carbonic Acid by the Action of Light on Plants.

In the *Monatsblätter* Herr Friedlin has some remarks about carbon prints and printing, amongst which the following observation seems worth a little attention:—He has remarked that in carbon prints—especially in large reproductions—the high lights strike the eye as much harsher than in silver prints upon albumenised paper. The superiority of albumenised paper in this respect he attributes to the fact that even when white albumenised paper is used a slight—very slight—tint, but sufficient to relieve the eye, is given in printing to the whole paper. This is not the case with carbon tissue, where the highest lights remain a dead white. To obviate this defect Herr Friedlin advises the use of slightly-tinted paper for the last transfer, so as to soften the lights. The most suitable tint he thinks is rose, leaning towards blue; but not such a deep tint as that of rose-tinted albumenised paper. For dark pictures one does not require to be so particular; but for light ones, with very tender gradations of shade, he thinks the proper shade would be that which, when one looked at a whole sheet, would appear quite white, and which, if laid beside a strongly-coloured sheet, would still appear white, but which, if contrasted with a pure white, looks distinctly pink. As a colouring medium, carmine dissolved in ammonia has proved excellent.

As a warning against the use of aniline dyes, either for carbon tissue or lichtdruck, Herr Friedlin mentions that lately, when visiting the establishment of Herr C. Bolhövener, he was shown a couple of lichtdruck prints tinted with aniline colour. One print, which had been kept in the dark, had the tone of a brilliant photograph; while the other, which had been exposed to the light in a show-case, had not faded, but been converted into an equally brilliant grass-green picture.

At the present time, when the effects of light upon plants and animals is so much spoken of in its general bearings, as well as in the more limited view comprehended by the blue glass and other cures, the following extract from the *Comptes Rendus* may be interesting, as embodying the most recent information on the subject:—As early as 1782 Sennebier ascertained that the green leaves of plants when under the influence of sunlight decompose the carbonic acid in the atmosphere and set the oxygen free. At first it was supposed that the most active rays, photographically speaking (blue and violet), were the most powerful agents in producing this effect; but in 1854 Gardner discovered that this decomposition took place with considerably greater rapidity under yellow glass than under blue. This phenomenon may be observed by anyone who dips the leaves of a plant into a vessel holding water containing carbonic acid; he will soon see the oxygen developed by the light rising in bubbles to the surface. As this effect is only produced by the green parts of the plants it is a natural inference that chlorophyll plays a real part in the action. In the spectroscope it shows a very great power of absorption for the red light between the sun lines B and C, and as only the rays absorbed should exercise a chemical influence, one would be justified in supposing that the red rays act most powerfully in bringing about decomposition of carbonic acid. Yet experiment undertaken with a view to clearing up this point show that yellow light, which is but slightly absorbed, has a considerably more favourable action than red; at least in Deherain's experiments a greater quantity of gas was evolved under yellow light than under red.

This apparent infraction of the law of connection between absorption and chemical action has just been explained through Timirazeff's experiments. He did not content himself with the simple determination of the quantity of gas developed by light, but he submitted it to analysis. Besides that, for his experiments, he used a sun spectrum and not coloured pieces of glass, which can never furnish the pure colours of the sun's spectrum; and, moreover, he used no water charged with carbonic acid, but air containing five per cent. of carbonic acid. Lastly, he used for his experiment bamboo leaves, which offered almost equal surfaces. He filled the tubes with the carbonic acid containing air, placed the leaves in them, and then inverted the tubes in mercury. He then exposed a row of five tubes, one under each of the red, yellow-red, orange, yellow, and green parts of as pure a sun spectrum as could be obtained. The sides of the vessels were protected from light by black cardboard cases. All these conditions being observed, the green leaves were exposed from six to ten hours on beautiful days in July under the spectrum. After the exposure the gases were removed from the vessels and analysed. As the composition of the mixture of gases used was known, it was easy to calculate the quantity of carbonic acid which had disappeared or been decomposed. Six repetitions of the experiment were unanimous in giving the same result.

The conclusions to which these six experiments point are:—That the greatest decomposition of carbonic acid is always observed in the vessel which corresponds to the place of the characteristic absorption bands of the chlorophyll; that in the orange, the yellow, and the green there was always a diminution of the quantity of decomposed carbonic acid; while in the extreme red one could not only distinguish no decomposition, but, owing to what we may call the breathing of the leaf, carbonic acid had been given off. The circumstance that the blue parts of the spectrum occasion little or no decomposition of CO_2 though they are absorbed by the chlorophyll, Herr Timiriazeff thinks may be explained by a want of energy in the most refracted rays.

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Meetings of Societies.

MANCHESTER PHOTOGRAPHIC SOCIETY.

The annual meeting of this Society was held on Thursday evening, the 11th inst.,—the President, Mr. A. Brothers, F.R.A.S., in the chair.

The minutes of the May and September meetings were read and confirmed.

The President then read the

ANNUAL REPORT.

In presenting the annual report of the session just closed, your Council consider it their first duty to express their sincere regret at the death of Mr. J. H. Young, who had for many years been the much-respected Treasurer of the Society. Mr. Young's invariable courtesy and business ability ensured for him the respect and friendship of every member of the Society with whom he came in contact, and his genial presence will be greatly missed.

The balance sheet prepared by the Auditors will be presented for your acceptance.

The Society may be said to be fairly prosperous. There are at present seventy members on the books, against sixty-eight in the previous session.

The attendance at the meetings shows a slight increase—twenty-nine and a-half against twenty-eight—which is probably due to the gastronomic entertainment in March.

Papers for discussion are becoming increasingly difficult to obtain, and consequently the record of last year's efforts in that respect are unsatisfactory. In other respects the meetings have not suffered for want of both instructive and interesting subjects. You have had a paper from the Rev. Canon Beechey, M.A., ex-President, *On Beechey Dry Plates*. One by Mr. Noton, *On the Production of Back Pressure in the Oxygen Machine*, with practical illustrations. One by Mr. W. J. Chadwick, *On a New Form of Oxygen Generator*, when the machine was exhibited in action. Mr. Noton followed with a short description and exhibition of another new oxygen machine, and Mr. D. Young with a communication on the same subject. Mr. Pollitt read a paper *On Swing Fronts* versus *Swing Backs*.

Your Council once more request the members to bring all they can, in the shape of failures or anything else, to the monthly meetings. The object of the Society is not display. The cause of every success or non-success is, or ought to be, the pursuit of every member, and one of the ways to that end is to show examples at the meetings, so as to elicit by discussion the why and the wherefore, as far as possible, of everything photographic.

The annual report was adopted, after which the Treasurer's accounts were considered and passed.

Mr. J. H. Galloway and Mr. George A. Brooks were elected members of the Society.

The election of officers for the ensuing year was then proceeded with, and resulted in the following elections:—*President:* Alfred Brothers, F.R.A.S.—*Vice-President:* Rev. Canon Beechey, M.A., Thos. Haywood, G. T. Lund, M. Noton, I. Wade.—*Council:* A. Coventry, J. T. Chapman, W. J. Chadwick, J. W. Leigh, John Pollitt, J. B. Payne, J. C. Sewell, W. Stevenson, John Warburton, N. Wright.—*Treasurer:* W. G. Coote.—*Honorary Secretary:* Chas. Adin, Clifton Bank, Wellington-road, Whalley-range, Manchester.

During the examination of the voting-papers Mr. Chadwick exhibited some excellent prints from emulsion negatives, produced by Mr. Woodbury. He (Mr. Chadwick) also exhibited and experimented with a little apparatus for lighting gas jets by electricity.

Mr. Leigh showed several collodio-albumen negatives which had received much shorter exposures than such plates are generally supposed to require. One of these negatives had received an exposure of only forty seconds, one afternoon early in September. This was a fair negative, but somewhat under-exposed.

Messrs. A. Brothers, W. G. Coote, G. T. Lund, N. Wright, and I. Wade, together with the Secretary, were appointed a sub-committee to revise the rules.

The usual complimentary votes were passed, and the meeting was adjourned.

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GLASGOW PHOTOGRAPHIC ASSOCIATION.

A meeting of this Association was held on the 10th inst., at the Religious Institution Rooms,—Mr. John Parker, Vice-President, occupying the chair. The Treasurer's statement having been read and passed,

Mr. Johnston made a few remarks on his experience with his emulsion, stating that he could get uniform results without fogging and any degree of density. It was exceedingly rapid when freshly made, and when kept the loss of sensitiveness was not great; for even after six months it could be used. The plates were coated and kept moist, and exposed hours after, or they might be used dry. The developer he used was alkaline, consisting of—

Water	100 parts.
Ammonia	$\frac{1}{60}$ part.
Pyrogallic acid	2 parts.

No redevelopment was needed. He (Mr. Johnston) showed some pictures taken by new emulsion in half-a-second; also some by *old* taken in three minutes. He had negatives to show the different degrees of density.

The members thanked Mr. Johnston for having brought the pictures and process before them.

A lantern exhibition followed, and a number of pictures by Wilson, Valentine, York, Woodbury, Levy (of Paris), and by members of the Association were exhibited.

Mr. Mason, Mr. Bell, and Mr. Swan were thanked for their services in connection with the lantern exhibition, which was very successful.

A statement to the following effect was read from the Swan Patent Committee:—The Autotype Company have been making reference to our Association when answering correspondents in The British Journal of Photography. They say, at page 443:—"The recent attempt of the Glasgow Photographic Association to organise a systematic opposition to the carbon patents met with the coldest possible response, for the simple reason that no one is really oppressed by the patents' claim." Again, at page 466, they say:—"Had the Glasgow Photographic Association been aware of the facts about Swan's patent they might have saved themselves some expenditure, a good deal of trouble, and some rebuffs; for, whatever the success may have been, we know a good deal to the contrary side of the account." We beg, in reply to the Autotype Company, to say that we did not try to organise a systematic opposition to the carbon patents. What we tried was to prevent Swan's patent being renewed, and we hope that success will crown our efforts. But the patent has not expired yet, so we say no more, but we are still watching; and if it be a fact that Mr. Swan "got a good and sufficient sum for his patent" we are very glad to hear it. Then, if we have got some rebuffs they must have been of such a nature that we could not understand them. But that is to be expected; for, as Scotchmen are said to require a surgical operation before they can see a joke, so it may be with rebuffs. If the Autotype Company want us to know something we never heard of before it would be better if they gave some particulars, as neither by letter nor in the Journal have we found what they refer to. Like the "Peripatetic Photographer," our wish is that the shadow of the Autotype Company may never grow less.

This statement was unanimously adopted and ordered to be sent, with a report of the meeting, to The British Journal of Photography, and the Committee was heartily thanked for their past labours.

This concluded the business, and a vote of thanks was given to Mr. Parker for the manner in which he had presided.

BALANCE SHEET OF THE GLASGOW PHOTOGRAPHIC ASSOCIATION
For the Session 1876-77.

Receipts.	£	s.	d.	Payments.	£	s.	d.
To Balance in hands from Session 1876	4	17	5	By Rent of Room	2	19	0
,, Membership from Session 1876-77	20	0	0	,, Expenses connected with prize picture from Edinburgh	2	7	3
				,, Dr. Nicol's Expenses	2	2	0
				,, Mr. Mactear's Account	2	17	0
				,, Secretary's Expenses for Postage, &c.............	2	6	8
				,, Klary's Book and Postage..	2	0	9
				,, Sundries	0	2	0
				,, Cash in hand..............	10	2	9
	£24	17	5		£24	17	5

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Correspondence.

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EMULSIFYING CHLORIDE OF SILVER.

To the Editors.

Gentlemen,—If I understand Mr. Brooks rightly, he, in the fifth paragraph of his late communication to the South London Photographic Society, states his opinion that "a chloride cannot be successfully worked in a gelatine emulsion."

Now it is a fact that under these very circumstances—and I may almost say under these alone—chloride of silver may be successfully employed instead of the bromide. This fact, so far as I am aware, I was the first to publish, at a time when silver chloride was looked upon as not being manageable with the alkaline mode of development, though, theoretically, it was thought likely to produce greater rapidity if the reducing action of the developer could only be held in check.

Taking the results of the whole of my experiments, which I published from time to time in your Journal, it would appear that the chloride is not capable of producing greater rapidity than bromide of silver—a fact to be accounted for by the supposition that the chloride may not be sensitive to so great a degree to the less refrangible rays. It is, also, a new fact to me to learn that the insoluble silver chloride can attract moisture from the air. I never noticed such a property in the many plates I prepared.

Apropos of this subject, I would suggest that silver chloride may yet be worthy of further experiments, having two or three months ago found that there is no abnormal reducing action on ordinary chlorised paper sensitised and washed in the dark room if the hydrosulphite of soda be used instead of the alkaline developer. It is, therefore, highly probable that a chlorised collodion film could be developed in the same manner.

This reminds me that the frame of photographs sent by me to the Photographic Exhibition, poorer in comparison with others though they be, may be made more interesting by the fact that they are probably the only ones in the exhibition produced from negatives developed by the hydrosulphite of soda developer.

With regard to Mr. Ellerbeck's method of using chlorised paper for the actinometer: would it not be better to use a bromised paper in preference to the chlorised? During the day, including sunset, I should suppose that the chlorised paper would exhibit greater differences in the action of the rays upon it than would the bromised paper. Therefore, the plates being bromised, would it not be better to employ the same silver salt in the paper for the actinometer?—I am, yours, &c.,

31, *Grove-place, Brompton, S. W.*, Herbert B. Berkeley.
October 15, 1877.

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SPOTS ON EMULSION PLATES.

To the Editors.

Gentlemen,—And is it really by the mouth of Mr. W. Brooks the oracle has arisen to speak authoritatively, with no uncertain sound, anent spots in washed emulsions? It seems so. Who would have ventured to throw ridicule upon the patient, laborious, and scientifically-conducted efforts of our Editors, and a few scientific gentlemen to boot, to diagnose the cause and the nature of these spots, even though they are fain to confess themselves baffled, and, like honest men, admit defeat. And yet how ridiculously simple the difficulty! What mountains have hitherto been made of mole-hills! When I read the grandiloquent heading which ushers in the paper of Mr. Brooks in which he so generously explained to the members of the South London Photographic Society the whole causes and the cure of spots, I exclaimed—"What a blessing has at length come to us!" But when I read the paper itself I exclaimed—"What a —— ahem! ah! no! yes! what?" Permit me to analyse this *pronunciamiento*, and sift the wheat from the chaff.

Dear! dear! what good things diagrams would be! What aids! and what benighted fools we must have been to think the spots were legion! There are but *three*, says Mr. Brooks.

Spot No. 1 is caused by dust, which may be inert or inactive, the latter comprising a bromide, an iodide, or an acid substance. But, query—Who keeps his bromides and iodides loose or in paper, and not in a bottle? How many have a particle of either in the house? And what acid substance, in the name of all that is photographic, does Mr. Brooks suggest as an example?

Spot No. 2, it is averred, is caused by the evaporation of ether and alcohol from the film, the latter of which absorbs moisture from the atmosphere and causes patchiness, the chloride of silver present absorbing moisture also. Where is the analogy between a collodio-bromide washed emulsion and its developed negative and the collodio-chloride unwashed emulsion and its printed positive? Is there not a total difference between the character of spots incident to unwashed and washed collodio-bromide emulsion? and yet these emulsions have some analogy. Can defects in one thing be reasonably accounted for by reference to defects in another thing totally different in its character? If they can, let me follow Mr. Brooks, and ask him what is the cause of spot No. 2 on collodio-chloride emulsion?

Then as to spot No. 3. Lives there the man so rich in this world's gear and so profuse in the use of the noble metal, silver, as to keep its nitrate loose on the shelves and floating in their airy particles about his laboratory? Careless man! Foolish man! Why cry out about spots? Throw away your silver or give it to your poorer brother, and have no more spots. And what "alkaline" substances would Mr. Brooks suggest as an example?

Now for the cure! Ah! how simple! Dry your plate by heat, and get it into your slide. Let no noxious, floating, airy, phantom-like forms embrace it, and then no more spots! Hurrah! Hurrah! Would that the remedy had only been reliable, and that in it we had a total preventive of all washed emulsion ills.—I am, yours, &c.,

Hammersmith, October 17, 1877. George T. Moore.

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COLD SPIRIT VARNISH.

To the Editors.

Gentlemen,—In today's number of The British Journal of Photography, the "Peripatetic Photographer" pens a most tantalising paragraph. He describes how easily he varnishes his negatives without heat, and then leaves us almost in the dark as to the varnish used.

As I am just engaged on a large number of experiments with different resins for varnishes and polishes I, for one, should be grateful to the "Peripatetic" if he would kindly state of what resins his satisfactory varnish is composed; and, as I believe the information would prove interesting to many besides myself, I venture to ask for it through the medium of the pages of the Journal.—I am, yours, &c.,

Homehurst, Torquay, October 12, 1877. Henry Cooper.

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GELATINO-BROMIDE, ALCOHOL, AND OTHER TOPICS.

To the Editors.

Gentlemen,—We hold it to be as important to correct an error as to record a new fact. Some few of mankind are born with genius, but the great majority are blessed with only plain common sense. To the former we look for startling ideas and discoveries, and on the latter devolves the duty of weighing these flights of imagination in the scales of plain logic. This, then, is our excuse for the following few sentences.

First in order of sequence we take the communication of your justly-esteemed correspondent, Dr. John Nicol. We did hope that, in response to our hint to look again into the alcoholic question, he would not have omitted to give us some reliable information on the law of sale of methylated spirit of various s.g.'s, especially as in his first letter on the subject he gently insinuated possible illegality in regard to methylated alcohol, ·805, or, rather, what he termed ·796. As to the custom in Scotland we do not pretend to speak, but for London we can say the ordinary methylated spirit (not the "finish" of the oilmen) has a s.g. of ·815 when first supplied. The sample we tested was from a ten-gallon tin only half full, and this accounts for its having gone up to ·817. Moreover, the sample of reputed ·805 we believe to be really of that strength when first bottled, but the greater the strength the greater the avidity or affinity for water, and unless hermetically sealed or luted it soon increases in s.g. In a bottle simply stoppered, no matter how tightly, its full strength cannot be maintained a single day.

We are unable to agree with Dr. Nicol that methylated alcohol of s.g. ·823 and upwards answers all the requirements of the photographer. True it is that professionals have not yet as a body taken to the use of collodion emulsions for outdoor work, but a minority of the foremost workers are fully alive to its value. Some, indeed, go so far as to say the wet plate for landscape photography is soon to be a thing of the past. Now, since on the principle of economy (despite those bugbears, spots, which some are troubled with) some photographers may wish to make their own emulsion—and if success depended upon formulæ (of which we have enough in all plentitude) they would doubtless do so—

here is one requirement for stronger methylated spirit than ·823. As to the comparative value of methylated and pure spirit for emulsions any distinction would, in our opinion, be in favour of the former. And, now, as to the sale in point of legality of these higher strengths: we find in Fownes's *Manual of Chemistry*, 9th edition, page 447 (foot note), the following:—

> "The high duty on spirits of wine in this country has hitherto interfered with the development of many branches of industry which are dependent on the free use of this important liquid. The labours of the scientific chemist have been likewise often checked by this inconvenience. A remedy for the evil has been supplied by a very important measure, proposed and carried out by the late Mr. John Wood, chairman of the Board of Inland Revenue. This measure consists in issuing, for manufacturing and scientific purposes, duty free, a mixture of 90 per cent. of spirits of wine, of *not less* strength than corresponds to a density of ·830, with 10 per cent. of purified wood spirit, which is now sold by licensed dealers under the name of methylated spirit."

We have not been able to ascertain whether this useful enactment has been repealed or superseded; we believe it has not. Its meaning is clear and unequivocal. The only condition is that the pure spirit shall not be of *less* strength than ·830, and it has strict bearing on the point, for who will deny that making emulsions is a branch of manufacturing industry? Unless Dr. Nicol can give further information we consider the question settled. *We* have nothing further to say on the subject, and we apologise to your readers for occupying so much space on, perhaps, what is not a topic of general interest to them.

And now for a few words, also, by way of final response to Mr. G. Morton. The addition of organic matter to gelatine is, according to this gentleman's opinion, beneficial—in fact, all *couleur de rose*. The addition of sugar to the collodion, or sugar or gelatine to the developer, in the wet process, though each has had its advocates, has been generally (the first blush of novelty past) discontinued, except for special purposes, where the one all-desirable condition, rapidity, has been immaterial. It has been condemned, in point of fact, because with corresponding exposure negatives inferior in detail and other good qualities have resulted from the employment of these ingredients. Our experience with these and analogous ingredients in gelatine emulsion has not been dissimilar. In other words, the resulting dry plates have been slower, and the tendency, even with apparent full exposure, has been to give harsh high lights and too cadaverous shadows. We anticipate the reply. We do not care for too much rapidity; rapidity is of little moment if we can get density. But how are we to obtain density without these adjuncts? We respond: save your silver, work with free bromide, use your developer with due regard to the restraining power of the bromide, and the accelerating and density-giving power of the ammonia in conjunction with the pyro. Study to use your developer judiciously, and the other condition—a modicum, more or less, of free bromide left in the emulsion—will enable you to get density with the utmost ease. Wherefore, we repeat, "the addition of organic matter to gelatine emulsions is unnecessary, if not baneful."

The great defect of these discussions is, perhaps, the widely-different appreciation of what is good in negatives, which undoubtedly exists in the minds of the opposing parties. In no other art is, perhaps, a wider area of difference in this respect possible; hence the difficulty of convincing one another.

One final word in taking our leave of the discussion. If we have written anything of a nature calculated to give pain to anyone of the disputants we tender him the *amende honorable*. We have had no wish to offend. In any discussions in which we may hereafter take part we desire there may be no allusions to motives for this thing, that thing, or the other. Let these be eschewed; their baneful effect operates to disturb that calmness of mind so essential for the proper exposition of thought. If, after all that has been written, there still prevail two opinions as to the relative value of ridding the soluble nitrate from gelatino-bromide emulsion by the alcoholic or aqueous treatment, the employment or non-employment of organic matter in addition to gelatine in this process, or the s.g.'s of commercial samples of methylated or pure spirit, there can be but one in regard to motives, viz., that they are a disturbing element in discussions, and an abstract element utterly valueless in emulsions.—We are, yours, &c.,

October 16, 1877. WRATTEN AND WAINWRIGHT.

FADING OF SILVER PRINTS.

To the EDITORS.

GENTLEMEN,—May I, through your columns, ask for contributions exemplifying the fading of silver prints? I am anxious to get a few really good examples *(of which the history is known)*, in order to investigate the causes which lead to it.—I am, yours, &c.,

W. DE W. ABNEY, *Capt. R.E.*

South Kensington Museum, October 16, 1877.

P.S.—Unmounted prints would be the most useful.—W. de W. A.

"OCCIDENT" ON THE TROT.—A short time ago we received a Californian newspaper from which we ascertained that a singularly-clever feat had been performed by a well-known firm of photographers, namely, the taking of a photograph of the horse "Occident" while rapidly trotting, each of his four feet being distinctly visible. A friend afterwards showed us a copy of the photograph said to have been thus obtained, but it had so very much the appearance of either being most elaborately worked up, or of being simply copied from a lithograph or drawing, that in the absence of fuller information we took no further notice of the matter. From the *Bristol Times and Mirror* we learn that the peculiarity of the step of a fast trotter has been greatly exercising the horsey minds of California, and numerous bets are pending on the subject. Occident, being the quickest trotter in the United States, and possibly in the world, is, observes our contemporary, to be the subject of an experiment:—"A series of photographic views are to be taken that will show the step in all its stages. For instance, Occident moves twenty feet at a stride, and the operator will have a dozen photographic cameras placed at intervals of two feet, making a total distance of twenty-four feet—a little more than a full stride. The shutters of these cameras will be opened and shut by electricity as the horse passes in front of each, the time of exposure being not more than the thousandth part of a second. The twelve pictures will be taken within two-thirds of a second—the time required for travelling twenty-four feet at a speed of 2.37. Each picture will be taken by a double lens, so as to be adapted for the stereoscope, and will thus furnish the most conclusive proof to connoisseurs that it is faithfully taken by photography, and not materially changed by retouching. It is a happy thought. We hope it will be successful."

PHOTOGRAPHY IN COURT.—At the Shoreditch County Court, on Monday last, the case of Hooper *v.* the Baron Nastrosky was heard before Mr. Judge Dussent. The plaintiff, a photographer's assistant, sued the defendant, a photographer, carrying on business at 3, New Broad-street, and 7, Newington Causeway, sought to recover the sum of 30s. for one week's wages in lieu of notice. The plaintiff said he had, prior to the present action, summoned the defendant to the Police Court, but was told by the magistrate to bring an action in the County Court. The judge said:—"Exactly so, when the police magistrates are tired of cases like the present they generally send them to County Court judges; however, go on." The plaintiff having proved his case, the defendant said he was perfectly willing to settle with the plaintiff amicably, but the facts were simply these:—Owing to the prevalence of bad weather the plaintiff had given him notice to leave, since which he (the plaintiff) had behaved in a very rude manner, and had broken a silver bath in a manner which could not have been the result of an accident; and when the plaintiff left him he would have paid him his wages less 10s., the value which he put on the silver bath he had broken, but the plaintiff would not agree to that. The plaintiff added he would prefer that the matter should be adjudicated upon by his honour. The judge:—"Very well, as you have not taken advantage of the new absurd Act of Parliament which enables you to set up a counter claim, which you might have done for the value of the broken bath, I shall give judgment in favour of the plaintiff for the full amount claimed, and leave you to sue for the damage, if you like." The defendant said he should not do that, upon which judgment was entered for the plaintiff, with an immediate order for payment.—*Fitz-Cook* v. *Pim*.—This action was brought on Monday last, the 15th inst., by an artist, against Captain Pim, M.P., to recover £26 15s. 6d. for work done and materials provided, and was tried before Mr. Russell Gurney and a common jury in the Lord Mayor's Court. The defendant pleaded never indebted.—Mr. M'Call was counsel for the plaintiff; Mr. Tatlock for the defendant.—From the opening speech of Mr. M'Call it appeared that the plaintiff was an artist, who for a considerable time had been engaged on leading illustrated journals, and the defendant was Captain Bedford Pim, M.P. for Gravesend—a retired naval officer and a member of the bar. In the course of last year Captain Pim, through Mr. Wright, photographic publisher, of Fleet-street, entered into an agreement with the plaintiff for a series of drawings of celebrated naval paintings in Greenwich Hospital, from which it was proposed to reproduce phototints by the Art Union of London. At first the plaintiff thought he could do the work with the aid of photographs of the subjects for five guineas each, but after viewing the originals at the hospital he told Mr. Wright he could not undertake them for less than ten guineas each, and subsequently on November 27th he received a letter from that gentleman stating—"I can get the order for the copies of the Greenwich pictures if you will do one, and the rest if satisfactory; otherwise you are to receive £1 for expenses. These are the best terms I can get, and I must give an answer by Monday morning." The *Trafalgar* was afterwards selected as a trial picture, and the defendant's card was sent to the plaintiff as an authority to enter the picture-gallery for the purpose required. The plaintiff had been engaged for several days sketching the picture, when the weather prevented him continuing by impeding the light. The defendant wanted him to finish the picture, but, on his explaining the reason for being unable to go on, it was suggested he should start on another one—the *La Hogue*—which he did, and finished. Afterwards it was said that the Art Union had abandoned the idea, and the matter fell to the ground. The plaintiff now sought to recover the sum claimed for the price of two drawings, and expenses and materials.—Mr. Wright was called as a witness for the plaintiff, and from his evidence it was ascertained that the defendant was desirous of entering into an arrangement with the Art Union to supply them with a series of articles on battles of the British navy, to be illustrated with phototints from the celebrated pictures at Greenwich Hospital. With that view Captain Pim put himself in communication with him (the witness), who made the proposal to the plaintiff which had been read. It was known that it was a speculation for their mutual benefit, and if it were rejected by the Art Union they would none of them benefit by it, hence the proposal to pay the plaintiff £1 if the affair was not a success. The picture *La Hogue* was submitted to the council of the Art Union, who rejected it, and the plaintiff was paid £1. He (the witness) was the greatest loser, as he would have had the order for the engraving of the pictures for the Art Union if the committee had accepted.—The learned judge ruled that there was no evidence of agency to bind the defendant, and nonsuited the plaintiff.

EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale*, that being done at a small cost in our advertising pages. This portion of our columns is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

A 52-inch bicycle, all bright, and a cabinet burnisher will be exchanged for a good *carte* lens and other photo. things.—Address, **Langton**, Broadway, South Hackney, London.

Wanted, in exchange for a large-sized violin and bow, cost 30s., and in capital playing order, a quarter-plate camera and two dark slides, in good condition. —Address, D. **Hughes**, 41, Waugh-street, Gateshead-on-Tyne.

ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

Notice.—Each correspondent is required to enclose his name and address although not necessarily for publication. Communications may, when thought desirable, appear under a *nom de plume* as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

⁂ A parcel containing "Answers to Correspondents," sent per post, has miscarried—not being received by the printer prior to going to press. Correspondents not receiving replies this week will understand why their communications have not received attention.

Freddie.—Yes; we do labour under the disadvantage at which you hint.

J. A. F.—The Vanderweyde patent was obtained in 1872, and is still in force in this country.

B. A. C.—A "power" of from a half-inch to a two-thirds will prove much more useful for the investigation of the phenomena than those of greater magnifying power.

George Cox.—The gentleman who wrote the series of articles signed "Armenius" died some time ago; but we have no doubt that the information you desire may be readily obtained from other sources.

"**Phonography.**"—Plain salted paper requires no special preparation for water colours. If albumenised prints be used it is sometimes necessary to apply the tongue to them in order to make the colour "take."

Y. Z.—When carbon tissue is so hard as not to be able to be got into sufficiently close contact with the negative it is an indication of its having been dried too quickly and at too high a temperature. Place it in a rather damp cellar for a short time, and it will soon be found to have become quite limp.

W. S. (Dulwich).—To stain the interior of a camera black, brush it over with a strong infusion of logwood, and let this be followed by the application of a solution of protosulphate of iron. Wood may also be blackened by means of a mixture of thin glue and lampblack, or by a spirit varnish mixed with a similar pigment.

Tyro.—For the purpose specified you do not require a camera of either fine fitting or fine finish. One that is constructed of common deal will answer quite well. A square body made of black velvet and kept distended by a light piece of framework will also answer the purpose. The length required is five feet six inches.

R. C. inquires:—"How can I obtain photographs of crystals?" several of which he mentions. Reply: allow the crystals to form on a clean glass, cause the light which illumines them to pass through a large Nicol's prism, and have a second prism of similar kind in front of the lens by which they are to be photographed.

Sartor Resartus.—Of the two forms, the swing-back and swing-front, we much prefer the former. There are several reasons which might be adduced in its favour, but we shall not here enter upon them. Our reasons *pro* and *con* have been given on several occasions both in the Journal and in the **Almanac**, and to these articles we refer you.

Edwin A. Cleaveland.—To obtain great intensity apply a tolerably strong solution of bromide of copper, made by mixing together solutions of bromide of potassium and sulphate of copper. This will whiten the negative, after which wash thoroughly and apply a ten-grain solution of nitrate of silver. Pure bromide of copper does not answer any better than a preparation made as above. See that the blacks of the image are very clear.

S. S.—We are not in a position to answer your query this week, but shall examine the samples enclosed, and then report.

Geo. Palmer.—It is probable that if the negative were placed in water for five minutes, and then transferred to a bath of weak bichloride of mercury, such a reduction of the intensity would take place as to enable you to obtain prints within a reasonable period of time. The density of a gelatine negative is of a very deceptive character; for, while it may seem to be very thin, visually, it may be exceedingly dense, actinically.

Vincent Fisher.—The desired effect can be obtained in the easiest manner imaginable. Transfer the portion of the farmer's pond that contains his ducks to your own lakelet. This photographic transfer of your neighbour's property to yourself will not outrage morality, all such things being fair in art. To effect the transfer, place the duck-pond negative in water acidulated with sulphuric acid, and when the film leaves the glass trim the required portion with a pair of scissors, and lay it carefully down upon your other negative in the position it is desired it should occupy.

N. W. R.—The dark precipitate is oxide of silver. We advise you to decant the greater part of the clear liquid, and see if it still fulfils the functions of a negative bath. If so, add to the liquid that remains with the deposit a little solution of caustic potash to ensure the precipitation of the whole of the silver. Wash the oxide with two or three changes of water, and then add barely enough nitric acid to dissolve it. Should the oxide not be required for conversion into the nitrate, it may be dissolved in a solution of cyanide of potassium, the resulting fluid then forming the best silvering solution known in connection with electro-metallurgy.

C. J. **Farlie** says:—"I am always glad to learn anything from your Journal, but how I am to cut forty-eight *cartes* from one sheet of paper I have yet to learn. Your contributor, Mr. W. H. Wells, says that a piece of paper $7\frac{1}{2} \times 4\frac{1}{4}$ will make four cards. As $2\frac{1}{4}$ is the width of the smallest cutting-glass that I have I cannot see how to do it. Of course, if you like to cut the *carte* size down to two inches you could get still more. I get forty cards by sensitising my paper in quarters. I do not think you can work much better than this."——Since receiving this letter we have had four *cartes* cut from a sheet of paper $7\frac{1}{2} \times 4\frac{1}{4}$, and find that they possess all the width that is necessary. Our present correspondent may have a cutting-shape made to any dimensions.

G. W.—Our correspondent puts to us certain queries respecting the application of the calotype process to canvas, which we believe several of our readers are better able to answer than we are, inasmuch as the matter involves experience in the production of canvas enlargements. We append his letter:—"Has any method of enlarging on canvas by the calotype process ever come under your notice in any of the journals? If so, can you refer me to the number? or, if not, could you give a hint how the canvas must be prepared to receive the iodising solution? I have some very good formulæ that I used for paper more than twenty years ago, but they do not answer on canvas. There seems requisite a preparation to enable the canvas to retain the iodising solution, and it seems to me that it should be of that nature that will be insoluble when once dried. This could be done with gelatine and chrome alum; but the question is—Would the chrome alum interfere and spoil the iodide in the after-solutions? It seems to have done so with what I have tried. I have seen canvas enlargements that have been done by the calotype process as clear and bright as a chloride print on paper. This is a process about which little has been written or spoken; still it is one of the most useful things required at the present day. If this subject be brought before the readers of the Journal it might be the means of getting proper formulæ brought out."

Received.—*Der Kohle-Druck, und dessen Anwendung beim Vergrosserungs-Verfahren.* Von Dr. Liesegang.

☞ **Editorial Communications should be addressed to "THE EDITORS"—Advertisements and Business Letters to "THE PUBLISHER"—at the Offices, 2. York Street, Covent Garden, London, W.C.**

METEOROLOGICAL REPORT.

Observations taken at 406, Strand, by J. H. Steward, Optician

For the Weeks ending October 17, 1877.

These Observations are Taken at 8.30 a.m.

Oct.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks
4	30.18	NE	45	47	60	40	Foggy
5	30·43	NE	46	49	64	43	Foggy
6	30·66	NE	45	48	64	42	Foggy
8	30·17	NE	49	53	56	43	Cloudy
9	30·33	NE	44	48	55	41	Fine
10	30·18	NW	42	43	—	39	Foggy
11	29·92	NW	46	50	58	41	Cloudy
12	29·95	W	47	50	58	44	Fine
13	29·86	W	54	57	64	47	Cloudy
15	29·67	SW	51	55	58	52	Cloudy
16	30·09	W	44	48	53	44	Fine
17	30·41	W	38	41	—	34	Fine

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 912. Vol. XXIV.—OCTOBER 26, 1877.

ON SUBSTITUTES FOR GLASS IN LANDSCAPE PHOTOGRAPHY.

In our article of last week we treated solely of the use of paper as a substitute for glass as the support for the photographic image, and we now have to consider what other substances are available for the same purpose. Unfortunately we find the list very limited, and when other materials are employed it is only by the adoption of a more complicated course of manipulation. In addition to Mr. Warnerke's tissue, which we have already mentioned, the following substances may be named as having, in one way or another, been utilised as supports for the collodion film, namely, mica, india-rubber, gutta-percha, collodion, and gelatine.

Mica, which forms a most perfect substitute for glass, possessing its transparency without the accompanying weight and bulk, is of little practical utility, owing to the impossibility of obtaining it in sheets or laminæ of sufficient size, so that, except for very small negatives of the pocket-camera size, we may dismiss it from further consideration. India-rubber and gutta-percha in solution have been used as a means of strengthening the collodion film so as to enable it to be removed from the glass after development, in the form of a pellicular negative; but, however well this function may be performed, we look with a certain amount of suspicion upon the probable stability of negatives so treated, on account of the liability of the two substances named to oxidise under the influence of the atmosphere. Most of our readers will be familiar with the effects of this oxidation in the case of gutta-percha baths and dishes, india-rubber tubing, and the numerous other articles in almost daily use, and they will be able to form an idea of how much more likely an extremely thin film is to suffer from the same cause than any of the comparatively bulky articles enumerated. Collodion has been applied to the same purpose, a coating of insoluble material being interposed to prevent its solvent action upon the film carrying the picture; but gelatine, when properly used, forms the best and most convenient substance for use in this direction.

None of the materials last named have secured practical application, in the form of sheets to be coated with collodion, and throughout the operations of producing a negative, to take the place of glass. A preparation of collodion under the names of "parkesine" and "*collodion cuir*" was talked about some years ago, but whether it ever got into the market commercially we are unable to say. This, if obtainable, might probably be worth a trial if composed of sufficiently pure materials to present a transparent and structureless medium. Gelatine is obtainable in transparent sheets of various degrees of thickness, being used for packing *bonbons* and fancy confectionery; but we have not found it to offer any feature of utility—at least for the purpose under discussion.

Thus we find that in order to avail ourselves of the advantages of portability, and at the same time to avoid the slight amount of grain inseparable from a paper support, we must adopt a more roundabout procedure, involving the transfer or removal of the collodion film from its original bed either before or after exposure. It may or may not be necessary to resort to a double transfer according to the nature of the second support used. We may, then, divide the various methods into two classes, of which Mr. Warnerke's and Mr. Woodbury's systems may be taken as the types, namely, (*a*) those on which the sensitive film is formed upon the flexible support, and after development, if desired, transferred to glass, and (*b*) those on which the film is prepared and exposed upon glass and afterwards transferred either temporarily or finally to a flexible support.

Each of these general methods has its own special advantages. Thus, the first named enables the tourist to carry with him a very large number of films with a minimum of weight and in a very small space. The collodion film, too, when in contact with a pliable and yielding substance, is less liable to injury than when glass is used, and, what is of perhaps greater importance, there is no liability to the defect known as blurring by reflection. On the other hand, there is the slight objection of having to expose through a sheet of glass in order to ensure a perfectly-plane surface. This entails a slight rearrangement of the ordinary camera, in order to secure coincidence of position between the ground glass and sensitive surface. The second system enables us with a limited supply of glass to prepare plates *en route;* moreover, it does not tie us to any particular process or description of plate. The latter may be wet, moist, or dry, prepared with the bath or with an emulsion. The objections which may be urged against it (but which are, perhaps, only matters of opinion in individual cases) are the necessity, in order to secure the full advantage as regards portability, of preparing and developing the plates while travelling—operations to which many, amateurs especially, strongly object. One benefit, however, which is likely to accrue from this is the probability of turning out better work; for it will be seen, before leaving a neighbourhood, what has been the result of each exposure, and those which are not satisfactory may be repeated. Moreover, the tendency to accept mediocre results which prevails when the number of plates is limited will be counteracted by the knowledge that there is no fear of running short of films.

So much for the respective claims of the two methods. Turning to the practical application of the first system we find the materials extremely limited; indeed, the means available to the ordinary requirements of the amateur do not extend beyond gelatine and paper—the latter, in this case, merely as a temporary support. We have prepared very satisfactory and easily-managed films of small size by the following process:—Coat a sheet of glass of any convenient size (say 11 × 9) with thin transfer collodion and allow it to dry, the glass being previously waxed to facilitate the subsequent removal of the film. Place it upon a levelling-stand, and, having slightly warmed it, pour over it to the depth of about a sixteenth of an inch a thick solution of clear gelatine containing one grain to the ounce of chrome alum and a sufficient quantity of glycerine to render it pliable without interfering with its drying. Allow the gelatine to set, and then put the plate away to dry in a warm cupboard free from dust. When quite dry coat with emulsion, and when that again has dried the compound film may be cut with a sharp penknife into four 5×4's and stripped from the glass, when it is ready for exposure in a suitably-arranged slide. As we have said, this method is scarcely applicable to any but the smallest sizes, owing to the difficulty of handling the tissue during development, in addition to which the trouble involved in the preparation of the gelatine-collodion support is too great in proportion to the advantages accruing from it.

A better plan consists in coating a stout, smooth sample of paper with gelatine. This may be done by floating the paper for a short time upon a solution of gelatine one ounce to the pint of water, removing it quickly but steadily, and laying it in a horizontal position until set, when it may be hung up in a warm place to dry. As the paper is only intended as a temporary support it is unnecessary to pay much attention to its transparency or freedom from structure, provided the surface be even; it is best, indeed, to employ a pretty thick sample, as it dries flatter and with less "curl" after applying the gelatine. When dry the gelatinised paper is pinned to a board, or other means adopted to keep it flat and smooth, and a coating of sensitive emulsion applied to it. After again drying it is cut up into the required size and stored away for use.

After exposure the paper is immersed in a dish of clean water until it lies flat; it is then laid upon a sheet of glass, and developed in the ordinary manner. But it must be borne in mind that the density will appear much greater through the paper than it really is, and allowance made accordingly. The last operation is the transfer to its final support, which may be glass or other material, as may be preferred. If a reversed glass negative for carbon printing be desired, coat a plate of glass with a thin film of gelatine rendered insoluble by the addition of chrome alum. These plates may be kept ready for use. When required, immerse in clean water for a short time to render the gelatine adhesive, and press the wet collodion film into intimate contact by means of the squeegee. After the lapse of half-an-hour again immerse the plate—this time in warm water of 90° or 100°—when in the course of a minute or two the paper support will float away, leaving the collodion picture firmly attached to the glass. Dry and varnish in the usual way.

If a non-reversed negative be required it will be necessary to float the collodion film off the paper support and then to replace the latter with a gelatinised plate, as in the last case. For this purpose immerse the paper negative, collodion side upwards, in a dish of warm water, when, after a few minutes, by dint of a little moving about and coaxing, the collodion film will become detached from the paper, which is then carefully withdrawn. Now carefully insert beneath the floating picture a prepared glass plate, and having manœuvred it into position draw it out of the water with the film attached. If this be properly done there should be no air-bubbles between the film and the glass; but if such should occur they may "conducted" to the edge by directing a gentle stream of water against them. Finally: lay a piece of clean paper on the collodion film, pass the squeegee very gently over the whole surface, and rear the negative up to dry.

Many will, perhaps, prefer a flexible final support, as, besides saving the expense of glass, it renders the negative printable from either side. After development let the paper negative be dried and pinned to a board. It may then be coated with india-rubber, gutta-percha, collodion, or insoluble gelatine, as described in the earlier portion of this article, and when dry the paper soaked off with warm water. If the last-named material be employed some little care is necessary to render success certain. The final layer of gelatine should receive a coating of collodion or india-rubber. The tissue should not be *immersed* in water, but sponged on the paper side with cold water and allowed to remain in the moist condition for five or ten minutes until the soluble gelatine has swelled; it is then floated, paper side downwards, on warm water until the paper becomes detached. The gelatine is now thoroughly removed from its surface, and the tissue negative dried between blotting-paper.

We now come to the second method, which, after what we have already said, will require little further description. The plates are prepared in the ordinary manner, whatever the process may be, the only point it is necessary to observe being the omission of the substratum, if such form part of the process. It is an improvement, though not absolutely necessary, to wax the glass previous to coating with collodion, as the removal of the film is facilitated thereby. The transfer may be effected by any of the methods we have just described; but for travelling purposes nothing can excel, in point of convenience, Mr. Woodbury's method. Paper coated with soluble gelatine also answers, either of these supports being afterwards removable. The other plans, though answering admirably for the mere removal of a film from glass, are scarcely available for use when at a distance from home and with but few appliances at hand for carrying out the operations. With gelatine paper, however, all that is needful in addition to the temporary support is a squeegee, and the film is ready for removal from the glass in an hour or so from the application of the paper, when the plates may be cleaned and recoated for next day's use.

We have said that in following this method any process may be employed. Such is, indeed, the case, but it is obvious that for convenience in travelling the washed emulsion far exceeds all others; yet if it be only for the saving in the weight of glass the workers of wet plates might probably find it worth their while to temporarily remove their films, as the operation entails not the slightest risk. We have now laid before our readers as plainly as we can the various possible means of dispensing, at least in part, with glass; and, if we have stated nothing absolutely new, we have endeavoured to point out the special features of each plan, and we trust that next year may see some of them doing practical service in the field.

PYROXYLINE.

We called attention a fortnight ago, on the authority of the *Mittheilungen*, to a prize offered, at the suggestion of Dr. Vogel, by the Association for the Promotion of Industral Technology, for an exhaustive treatise upon the composition of the most important descriptions of commercial pyroxyline; upon the influence which the temperature of the acid admixture in the preparation of pyroxyline exercises upon the photographic properties of the product; and, thirdly, upon the proportion which the natural or artifical admixture of the raw material—such as resin in the cotton, size in the paper, &c.—imparts to the pyroxyline prepared from them. The value of the prize offered is about seventy-five pounds, which would amount to about twenty-five pounds for each of the three investigations named—not a large sum certainly, yet one which might be an extra incentive to anyone who had already been investigating the subject *con amore*.

There could not be a better tribute to the value of emulsion processes, for details of the manufacture of pyroxyline suitable for all kinds of wet processes have already been given in the almost classic researches of Mr. F. Hardwich, who, in his well-known paper, may almost be said to have taught photographers generally what collodion was. Before that time many collodion makers were content to purchase their pyroxyline ready made from one dealer or another, with a want of uniformity that may now easily be accounted for; and the few photographers and others who did make their own pyroxyline usually considered they had produced a perfect sample if it dissolved easily and with little or no residue. Now, however, it is by no means an uncommon thing for a photographer to make his own collodion for the wet process from beginning to end. But when it comes to the manufacture of a sample suitable for emulsion purposes he is thrown entirely upon his own resources; for it is a well-known fact, and one we have frequently alluded to, that the characteristics of good wet collodion pyroxyline might be the very opposite of what emulsion demanded. Up to the present time, though we have from time to time given the results of numerous experiments in this direction, there yet exists no classification at all approaching what has been done with the older and better-known sorts.

For a systematic investigation of the kind for which the prize is to be given to be successfully and efficiently undertaken some amount of chemical lore and training is almost essential, as, with the knowledge of what has already been done, it is evident that the chief work of the experimentalist will lie with those "admixtures, artificial or natural," which mostly accompany the raw material. It has long been held that a decided difference of effect was obtainable with samples of pyroxyline made from paper and from cotton and also from flax. We believe that in this country the preference is usually given to cotton, while on the continent we hear most of paper and of flax; hence it would be necessary to make a searching examination of the various kinds of raw material, and this it would be difficult to do without some acquaintance with chemical analysis. At the same time, a practical man with a determination to make experiments on the subject need not be deterred by what we say; for, though he would be rather heavily weighted, he could obtain from the various text books a pretty accurate knowledge of the accompanying impurities of the various kinds of cellulose, and from technical works he would be able to learn the peculiarities of the various sizing materials made use of in the manufacture of paper.

We believe it would be by far the better course, as conducing to greater exactitude, to ascertain the behaviour of the various accidental materials, as we may term them, separately; for it is not likely that any mutual reaction between them and the cellulose would occur beyond the weakening of the acids and the probable alteration of temperature when they were present in any considerable quantity. A series of products would be obtained each of which might have its action tested with various samples of a pyroxyline as pure as could be obtained; for, as is well known, the best of commercial pyroxylines cannot be claimed as a pure and definite substance. The classes into which the various kinds will be found most readily to arrange themselves are the following:—First, varieties produced by differences of temperature; secondly, by alterations in the proportions of the mixed nitric and sulphuric acids; thirdly, by difference in the amount of water present. Each one of these causes is capable of modifying the other, and so a large series of pyroxylines, each having a different character of its own, may be produced. It may be useful to repeat the leading characteristics of the products arranged under the three heads, so far as has been experienced with wet collodion, little alteration in which has been suggested since the researches of Mr. Hardwich to which we have already alluded.

First, as regards temperature: this has the most important action upon what may be called the chemical characteristics of the resulting collodion; the mechanical qualities are also affected, but not so entirely as by the other two modifying influences. The effect of increasing the temperature is to cause the collodion to give greater density, and our own experiences have ranged between 125° and 170° F., the latter giving a very dense, slow sample, and the former a weak and fairly rapid collodion. 145° has been the one we have mostly employed for iron development, and we have largely made and employed it. Concurrently with greater density we find increased fluidity, which with cotton made at 170° is very great, and at 125° unsatisfactory.

Next for consideration comes the proportion of the acid used, which we have tried from 1 to 1 up to 1 to 3½, the nitric being always the lesser quantity. Density is increased by increase of sulphuric acid, but not to so great a degree as by alteration in temperature. The flowing qualities of the collodion are increased by increase in the sulphuric acid, as is also the toughness. With increased toughness comes greater tendency to leave the glass, which, it is well known, all "skinny" collodions are liable to; but this property, more than any other, is altered by the variations given under the third heading. When equal proportions of the acids are employed a powdery cotton is obtained, which, *cæteris paribus*, does not give sufficient intensity. With the large proportion named a tough, skinny collodion is produced, repellant, and unsuited for general work. With the temperature named we have used the proportion of 1 to 2½ for our working collodion, the nitric acid being of s.g. 1·42.

Our third head—proportion of water—influences almost entirely the mechanical properties of the film to a most important extent, and too great a quantity produces a pyroxyline which gives a collodion which will neither flow nor adhere to the plates, and too small a proportion gives one producing an utterly useless film—drying white, paper-looking, and powdery. Such a collodion as the latter is impossible to use, from the incurable tendency to spots and markings of all kinds. Fortunately, the readiest means of correcting the results of experiments in this direction are available, for according to the proportion of water present so will the cotton increase in weight after conversion; thus the quality may always be foretold by weighing the pyroxyline after drying. We have found that any amount of gain between fifteen and thirty per cent. will give a collodion with excellent flowing qualities. An important caution may be given. Cotton is very hygroscopic, and should always be dried by heat before using if any uniformity of result be desired. A difference of five to ten per cent. in the increase of weight may be brought about by a difference in the state of the raw cotton in relation to atmospheric influence. With these memoranda and precautions we leave the matter in the hands of our readers.

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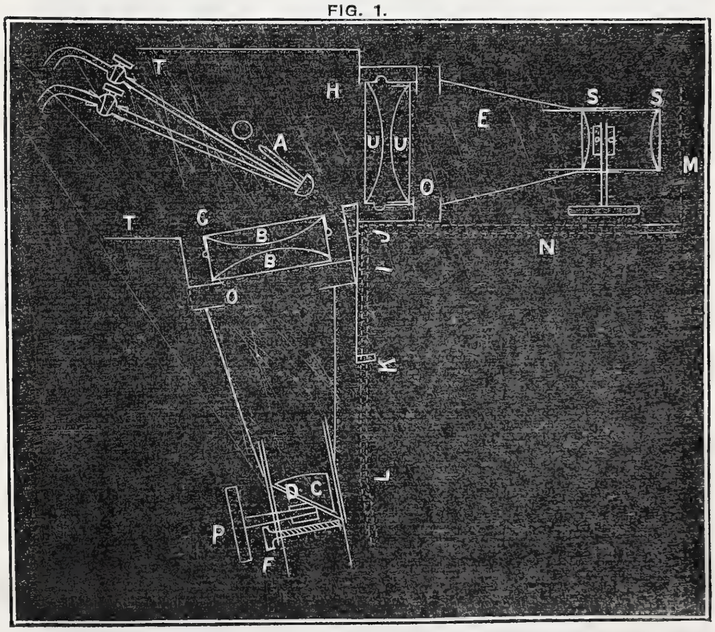
APPARATUS FOR PRODUCING DISSOLVING VIEWS.

A PERIOD of only six weeks has elapsed since we directed attention to a new piece of apparatus devoted to the exhibition of dissolving views by means of a lantern of the double-nosed genus. In that article we gave as complete details of the apparatus, its aim, and scope as was possible from having had an opportunity of seeing one of them for merely a few minutes; and in the concluding paragraph we stated that it might be anticipated that our readers would hear more from us in connection with "Keevil's Patent Newtonian Lantern," by which name it was introduced to our notice. This anticipation is to be realised sooner than we had expected, as the specification of Mr. Keevil's patent has just been published, by which we are now enabled to give the fullest possible details as to the manner in which the invention is sought to be carried into effect as secured by patent.

We have already given [*ante* page 434] a popular account of the instrument, and have said that in it were sought to be combined in one lantern the power to produce effects in "dissolving views" hitherto produced by two separate lanterns, the chief feature in the new apparatus being the utilisation of only one illuminating agent. At this point we allow the patentee to explain the precise manner in which he accomplishes his object.

The mode (he says) by which I accomplish the above is as follows:—*Fig.* 1, T T, are the sectional sides of a lantern of either metal or wood.

FIG. 1.

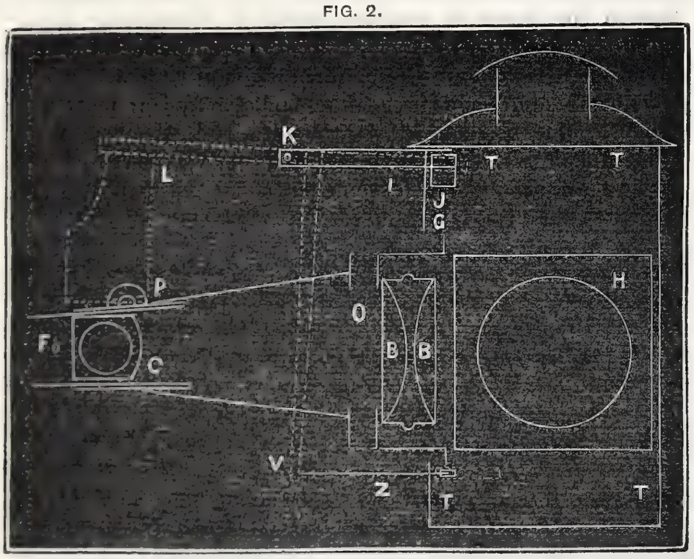


I adapt a prismatic lens, the sectional form of which is shown at C and having its diagonal surface D silvered, or a plane right-angled prism of glass having a lens or lenses fitted to it for the adjustment and focussing of the pictures placed in the stage at O, and focussed by means of the nut of the pinion and rack P, and to carry on the rays of light passing through the condensing lenses properly placed as shown at B B, to take the light emanating from a burner A for that purpose.

A modification of the above-described and the same optical effects may be produced by using a plane glass silvered speculum or metallic speculum with adjusting lenses adapted for focussing the scenes, as shown at *fig.* 4. In either case, my invention consists in placing the arrangement above named within the converging rays of light after passing through the condensers from the burner, as shown at C, and before they cross at a focal point, so as to intercept those rays and turn them in a direction nearly at right angles, in order to make the light cover and occupy the same place on the disc as that from the usual direct through or front optical arrangement shown at E, the complete adjustment being accomplished by an adjusting screw and spring connected with the frame of the prismatic lens, as shown at F.

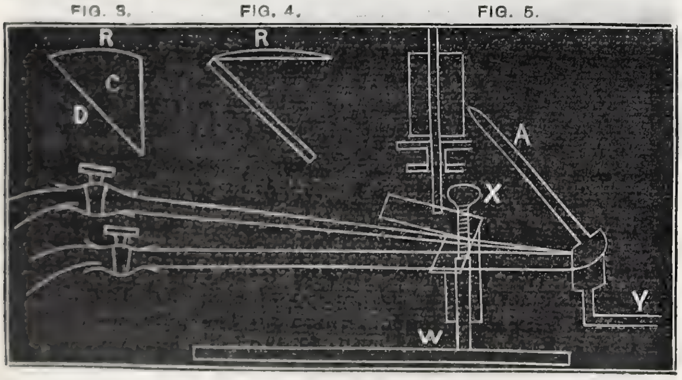
The above-described optical arrangement, which I claim as my invention or adaptation, when used in connection with any of the usual well-known levers and shutters hitherto in use, will produce the effects known as dissolving scenes from one light burner or jet only, and by the use of one lantern only. In order to produce the best effects I recommend that the side of the lantern G, to which my prismatic arrangement is attached, be bent inward to an angle of about 9° with the front, as shown in the drawing at H, and, in order to produce the dissolving effects by the above optical arrangement, I affix the lever I at any convenient place such as at J, and to move on a point at K, the position of the said lever and shutters being shown by the dotted lines. A shutter is fixed at the end of the arm L, to work and cover the rays of light emanating from the prismatic lens at C, and another shutter M is placed at the arm N, to work and cover the rays of light emanating from the direct through optical arrangement at E, and, by working the lever either up or down, the desired effects can and will be produced. And when the light used for the purpose is that known as the lime light or oxy-calcium light, then, in order to produce a uniform intensity of light all over each circle or disc, of course the burner A and the lime to swing on a centre W or pivot, such pivot having a screw above it at X, *fig* 5, for adjusting the height of the light, and by connecting an arm Y of the burner A with the rod Z and with the levers shown at V, *fig.* 2, the same is made to turn or face alternately opposite to the condensers B B, or U U, as may in turn be required.

FIG. 2.



Having now described and particularly ascertained the nature of my invention, and in what manner the same is to be carried into effect and used, I would observe, in conclusion, that what I consider to be novel and original in its application to the above purpose, and therefore claim as secured to me by the said letters patent, are—

FIG. 3. FIG. 4. FIG. 5.



First. The arrangement, combination, and application of a prismatic convex lens, or a plane right-angled glass prism, or plane silvered glass, or metal speculum with lenses adapted to either modification in the manner hereinbefore described and illustrated, so as to intercept and turn the rays of light passing through and from the condensing lenses, and to render the one light or burner available for producing the effects on a disc known as dissolving scenes.

Secondly. By arranging the burner carrying the lime for producing the light to turn or swing on a pivot, so as to cause the flame alternatively to face each pair of condensers as may in turn be required. The meaning I attach to the words "prismatic lens" is that of a glass right-angled prism having one of its surfaces R, *fig.* 3, formed convex, and of such a radius as will cause it to magnify the pictures to a similar extent as that produced by the focussing lenses of the front arrangement S S, in the manner hereinbefore explained. The prism may also be made achromatic in the usual well-known way if required.

With regard to these claims: if it be correct, as we stated in our former article, that a prismatic arrangement has been previously applied to a lantern, it may clash with the former of the two special claims; but the great value of the invention lies not alone in the adoption of the reflecting system, but in the means, as indicated in the second claim, by which the lime light is applied to a lantern of this form.

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THE PHOTOGRAPHIC EXHIBITION.

[Third Notice.]

The days of pure white skies in photographs have nearly departed, and the judicious use of cloud negatives impart a charm to photographic pictures which without such adornment would be commonplace. While the great proportion of the landscapes in the Exhibition have this accessory present, expressed in more or less good taste, comparatively few exhibitors this year have displayed pictures in which the clouds themselves form the leading feature. We miss Mr. Stoddart, who on previous occasions made us familiar with the gorgeous display of fantastic clouds which were occasionally to be "glimpsed" off Margate. Mr. B. Wyles continues to contribute this year, as of yore, some of the attractive scenes in "cloudland" which have by means of his camera been brought down to *terra firma.* Colonel Stuart Wortley shows a number of photographs of the same class. Mr. Wyles does not confine his display to clouds, but exhibits several capital portraits, of which *A Roman* (215) is a good example.

We shall assume that the enlargements exhibited by Mr. John Adams are all that they should be, for, owing to the height at which they are hung, we are unable to see them properly.

Among several collodion "transfers" exhibited by Mr. O. Angel, *A Portrait* (391) may be cited as an example of the excellent tones it is possible to obtain by this attractive process. In close proximity to it are found several enlargements in carbon by Mr. Thomas Annan—a fine portrait of the late Sir George Harvey, P.R.S.A., being one of the most effective of the exhibits of this artist.

We may here observe it is to be regretted that some of the pictures on the backs of the screens had not been relegated to positions in which they could have been better seen. For example: there is a large frame of beautiful stereographs of flowers and other botanical subjects by Mr. F. H. Worsley Benison (517) which would well repay careful examination, and there is a collection of illustrations of a new process by Sir Thomas Parkyns (539), but in neither case can the pictures be subjected to the close scrutiny that is necessary. More especially is this so in the case of Sir Thomas Parkyns' pictures, which, being by a new process, might well have been hung in a good light, and otherwise placed under such circumstances as would ensure their easy examination. We have not yet been made aware of the nature of the process employed—which, being recently patented, will be revealed in due time—but we may state it is an attempt to impart to carbon pictures certain effects by means of colour, and we invite as *exigeant* an inspection of the examples as can be made under the circumstances.

The number of good landscape photographs in the Exhibition is proportionally greater than it has been for several years. This is so strongly impressed on our mind as to render it almost invidious to mention any names in connection with this department. No one possessing judgment and taste, however, will grudge one of the highest artistic positions to Mr. Payne Jennings, whose large and charming collection of pictures elicit encomiums from both the public and the expert. The tone of his works is a very rich, warm brown, bordering upon red; the subjects are attractive, and the treatment perfect, whether viewed artistically or technically. They appear to be mounted upon ground glass.

Among others who contribute to maintain the high reputation of landscape photographic art are Messrs. T. M. Brownrigg, F. T. Palmer, J. Milman Brown, F. Hollyer, E. Forhead, T. B. Hutton, R. V. Harman, G. F. Dew, E. Fox, Captain G. H. Verney, the Royal Engineers' School of Photography, and Mrs. H. E. Roscoe—a lady who exhibits here for the first time, but whose pictures furnish conclusive evidence of the possession of taste and culture by the fair artist.

Animal life—by which we mean that of the inferior animals—is cleverly represented. Mr. F. York, whose able delineations of the denizens of the Zoological Gardens won him so much fame, exhibits a fine collection of stereoscopic and other pictures of animals. Mr. R. V. Harman and Mr. D. Hedges exhibit clever pictures in the same direction; Mr. G. Nesbitt is stronger than ever in this *rôle;* while the large dog *Kepler* (242A), enlarged from a negative by Mr. J. Stuart, commands admiration. But cats as well as dogs are here to be found, and in the pictorial representation of the feline tribe Mr. H. Pointer appears to be *facile princeps.* In precisely the same relation to *Aylesbury Prize Ducks, Dark Brahmas, Light Brahmas, Japanese Silkies,* and several pictures of dead animals, stands Mr. S. G. Payne, whose various works are characterised by much skill and taste. These qualities, however, are displayed in their strongest form in the wonderful floral exhibits of Mrs. S. G. Payne, who to skill in the selection of the various flowers upon which she brings her camera to bear, and also delicate *finesse* in their arrangement, adds such perfect control of the luminous and chemical agents at her command as to render the spectator for the moment forgetful of the fact that the charming groups of flowers upon which he gazes are but in monochrome. As examples of Mrs. Payne's artistic work we may instance *Cottage Garden Flowers* (440, 441, 455), and *Stephanotes Cross* (519).

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It is, of course, the desire of the President and Council of the Photographic Society of Great Britain that the Exhibition now open should be made as instructive as possible. It has been suggested to us that greater significance would be attached to the Exhibition by the announcement, *at the earliest possible moment,* of the decision of the jurors respecting the best pictures, in their estimation, in the several classes for which medals are to be awarded, because it would induce practical photographers to bestow upon such pictures more attention and critical examination than they otherwise might do, and to note their various points of excellence. In conversation, the other day, with Mr. M. Whiting, a well-known member of the Amateur Field Club, that gentleman put this matter in its true light when he said, in effect—"I may have my own opinion as to the pictures I think best; but, having every confidence in the ability and integrity of the gentlemen who are appointed as jurors, I should like to make a careful study of the works which, in their estimation, are most entitled to meritorious notice, because in doing so I could then ascertain in what direction my own pictures display shortcomings, and thus, when making future attempts, attain a greater measure of perfection by recognising the points in which hitherto my pictures may have differed from those of accredited excellence. But in order to do this ample opportunity should be afforded to the visitors for studying the special characteristics of the various pictures deemed worthy of medals." In this is told the whole tale. The jurors should make their awards without delay, and also make them public, so as to afford exhibitors an opportunity of studying the composition, lighting, or general treatment of the pictures which the jurors, by their award, hold up as examples for others to follow.

All who have had any experience in touching out spots or blemishes in negative films (we do not refer to "retouching," so called, which may be done with the pencil) know how difficult it is to get the colour to "take" to the smooth varnished surface of the negative. Indian ink and ordinary water-colours behave as if the surface had been greased, and lie on where they like and not where they are wanted. In the case of a "hole" in the film the colour attaches strongly to the edge, leaving the centre transparent, which only adds to the evil. The addition of gum water makes matters more easy, but does not wholly remove the difficulty—in fact, sometimes adds to it. A simple method which has been previously spoken of deserves to be more fully known than it seems to be. We allude to the employment of the pigment of carbon tissue. The colour is in an extremely fine state of division, and the gelatine causes it to adhere readily to the glass or varnish wherever it is applied. First attempts may possibly develope some slight difficulties in manipulation owing to the rapid solidification of the gelatine in the brush; but if hot water be employed and the negative be also warmed all will be found perfectly easy. Let the tissue be soaked for some minutes in cold water (a piece one inch square will go a long way) and then placed on a palette or in a small porcelain capsule and heated until the pigment dissolves. A drop of dilute ammonia will improve it. A cup of hot water to retain the colour in the liquid state and to moisten the brush completes the outfit. From the transparency and evenness of the colour it will be found admirably adapted to the production of artificial clouds or for softening the outline when it is desired to block out any portions of a negative; and if diluted with a little plain gelatine solution it may be used for softening heavy shadows. For "spotting" silver prints it is also extremely useful if the right-coloured tissue be used, and we imagine that in most studios where carbon is employed at least some of the work is done in silver. We can recommend it as a simple matter of very great utility.

A FEW MORE EXPERIMENTS WITH GELATINE.

I presume it may be held that so far as landscape work is concerned the battle of the bath has been fought and lost, and that for all outdoor work emulsions have already almost taken, and will shortly altogether take, its place. In a recent article I tried to show that of the only two substances which have hitherto been successfully employed as the basis of such emulsions—namely, pyroxyline and gelatine—the latter possesses properties and advantages which should secure for it a decided preference over the former; but, as I know how difficult it is to lead the great bulk of photographers into a comparatively new channel, or to get them to give a fair trial to any process suspected of being beset with difficulties or uncertainty—that, in fact, they will not look at it till it has been written and talked about almost *ad nauseam*—I have continued my experiments, and am now anxiously writing, with a view of helping on what I believe to be the good cause.

When the happy time comes—which I fear is still in the far distant future—when the various actions and reactions comprised in the production of a perfect negative shall be thoroughly understood, the writers of the then period will doubtless make themselves merry over the diversity of opinion on even the apparently simplest matters that are week by week now expressed in the publications devoted to photographic literature, and which arises to a large extent from the groping in the dark still incident to so many of our operations. But while this diversity of opinion may be a source of merriment to them, it is really a great hindrance to us, and every step in the direction of clearing it away will assuredly bring us nearer to the desired goal —the general adoption of the most perfect process.

During the last three or four years the working of gelatine emulsions has been essayed by many operators, but I think it is not too much to say that satisfactory success has been attained by only a few; and, as the results both in the direction of failure and success have been pretty freely published, a little consideration of what those actually are may help the less fortunate out of their difficulties.

On the one hand, we find it asserted that with a plain solution of gelatine, holding in suspension a suitable quantity of silver bromide, negatives of the greatest excellence may be obtained, the image making its appearance rapidly under the action of an alkaline solution of pyrogallic acid, and rapidly acquiring density without tendency to fog or fault of any kind, while the film adheres as firmly to the glass as if it were collodio-albumen, and admits of as much liberty being taken with it as did the films of that useful, but now little-used, process. On the other hand, it is stated, as the experience of equally able workers, that while under such conditions a beautiful image readily makes its appearance it obstinately refuses to take sufficient intensity, or gets hopelessly fogged when an attempt to force it is made, and that, moreover, the film is liable to frill round the edges, and not unfrequently to break up all over the plate.

During the course of a series of experiments which have occupied me for several weeks I have had no difficulty in meeting with all these causes of failure, while at the same time getting also very satisfactory success, and now propose briefly to show what those experiments seem to teach. It may, however, be necessary to say that my object was the production of a very rapid film, and that these observations do not apply to emulsions containing free bromide, which are easily managed, and give, with most ordinary samples of gelatine, clean, dense negatives, although they are comparatively slow.

First, then, as a result of many experiments, I am persuaded that the frilling and breaking up of the film altogether, and the difficulty in getting density, to a large extent depends on the kind of gelatine employed. So far as can be gathered from the correspondence on the subject, the really pure gelatines manufactured by Nelson or Cox are those most generally used, and if there were nothing but proper adherence to the plate to be sought for they would do well enough, provided the shreds into which they are cut are not hard and brittle; any sample that is so should be rejected, as unless it be sufficiently flexible to admit of being bent on itself without breaking it will not answer well. Where, however, great sensitiveness is sought for the silver nitrate must be in excess; and, so far as I have gone, the increase of sensitiveness is in the exact ratio of that excess. But such an emulsion, if made with pure gelatine, gives an image which cannot be intensified by the ordinary alkaline developer, and can only be kept from fogging by a free application of a bromide or other restrainer. To obviate this recourse must be had to one of two things—either the use of an impure gelatine or the addition of some organic matter to the emulsion, and probably the adoption of both would be better. Of all the gelatines that I have tried nothing answered in every respect so well as the cheap French or German article (costing about one shilling per pound), or what is known as "best Scotch glue," either of the Kinghorn or Gorgie brands. Why an impure article should be better than a pure is, I think, not difficult to understand, and I offer the following as the explanation:—It is well known that the use of free silver in a collodion emulsion is only admissible where either hydrochloric acid or a chloride of some kind is present. In the case of gelatine organic matter takes the place of the chloride, combining with it in some way so as to deprive it of its fogging propensities, while leaving it free to exercise to the fullest its accelerating power. A single experiment will convince anyone of the truth of this statement. Soak twenty grains of pure gelatine in six drachms of water, and when properly swollen dissolve by a gentle heat, and add fifteen grains of cadmium bromide. Then dissolve twenty-five grains of silver nitrate in two drachms of water and add the solution to the gelatine in the usual way. Make another quantity in exactly the same way except that instead of water use a strong infusion of a suitable vegetable or organic matter. Of two plates coated, one with each of these emulsions, swilled in water as soon as set, dried and exposed for a period less than would be required for ordinary wet collodion, and developed with alkaline pyro., or rather with pyrogallic acid containing a trace of ammonia, the unorganified film yields an image of a pale green tint by transmitted light, but so feeble as to be useless. On pushing it, either by continued development or an additional supply of ammonia, no increase of intensity will be obtained, and the whole surface will by-and-by be covered with fog. The addition of a soluble bromide to the developer will help matters a little; but only to the extent of preventing the fogging, without the least increasing the density. With the organified plate it will be altogether different. The image makes its appearance under the developer quite as rapidly, and if fixed even at the earlier stages is of a brownish-green colour. It rapidly acquires density, and where additional ammonia may be required bears it without any tendency to fog or involving the necessity of a restraining agent.

The selection of a suitable organifier is of much more vital importance in this process than in either the collodion, emulsion, or plates prepared in the bath, and I am not yet in a position to say what, on the whole, I have found best. A more extended series of experiments would probably lead to something better than I have yet tried; but I may say, for the benefit of those who will think it worth their while to look into the subject, that only those substances that enter into combination and form a precipitate—that is, an insoluble compound—on the addition of a solution of silver nitrate, are, so far as my experience goes, likely to be found suitable.

The insoluble silver compound thus formed is, of course, retained in the film; and, although I have as yet no theoretical notion to advance as to how it does its work, I am satisfied that there is abundant evidence that it plays an important part.

John Nicol, Ph.D.

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SPOTS ON EMULSION PLATES.

Mr. W. Brooks, writing on the above subject in The British Journal of Photography for October 12th, describes spots as being of three kinds. Nos. 1 and 2 may be passed over without comment, as they are due to careless manipulation. Spots No. 3 are the kind that I should like to make a few remarks about, as I differ with Mr. Brooks as to their origin.

Black spots in an emulsion plate are caused by the emulsion from which the plates are prepared containing particles of *nitrate* of silver in suspension. You may prove this satisfactorily by exposing one-half of one of a batch of plates known to contain these spots to diffused light for a second or two. When you develope it you will see that on the part of the plate which has been so exposed spots will make their appearance, whilst on that half of the plate which has not been exposed there will be few, if any, spots.

The particles of nitrate of silver are suspended in the film, and as the light acts upon it it does so until it comes into contact with these particles. The developer acts regularly over the plate till it comes into contact with these particles; immediately it does so reduction takes place, and a black spot is the result.

In the case of the unexposed half of the plate no blackening occurs, as the particles of nitrate of silver are suspended (wrapped up) in the vehicle (collodion or gelatine, as the case may be), and the developer cannot get at it. If, however, any of these particles lie on the surface, or near enough to the surface for the developer to overcome the mechanical obstruction and to touch any of these particles, reduction immediately takes place and you get black spots.

This view of the matter shows why the sky and the most strongly-lighted part of an emulsion negative contain the greatest number of spots. The light unlocks the way for the developer to act upon the the particles of nitrate of silver.

How to get rid of these spots, then, is evident enough, namely, by thoroughly filtering the emulsion. I find in practice that the best way of doing this is by filtering it once through one filter to get rid of the coarser particles, and then to pass it through a rather finer filter twice.

J. Dudley Radcliffe.

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LICHTDRUCK WITH WATER COLOURS.

Until now it has been generally believed that only fatty inks are repelled by the more or less wet gelatine surface of lichtdruck plates, and, therefore, that these inks only are suited for lichtdruck printing. In the year 1869, however, the circumstance that a very thick solution of gum, dextrine, or starch, which at once adheres and sticks fast to any dry body it may be allowed to come in contact with, does not adhere to one's fingers when wet, yet shows a tendency to stick, suggested to me the thought that perhaps only the dry shadow parts of the lichtdruck plate would take on a very thick ink (of about the consistency of lithographic ink) composed of gum arabic, a pigment, and a very little water, while the lights of the picture being wet would repel the ink in the same way as it does the fatty ink.

The correctness of this idea was substantiated by my first experiment with such an ink. The pictures printed with this ink from lichtdruck plates, with either a smooth or granular surface, are in no respect inferior to those printed with varnish colour, and have not faded in the least since 1869. This phenomenon—that solid or thick adhesive substances do not adhere to less solid or fluid substances, but the reverse—is based upon the fact that the separate atoms in a thick solution hang together more firmly than in a thin. A thick solution of gum arabic, diluted with a very little water or glycerine to about the consistency of lithographic chalk ink, will only leave behind it a considerable number of the atoms which compose it when the connection between the molecules composing the object upon which it is rested is greater and more solid than that of the solution itself. If, on the contrary, it be placed in contact with a more fluid body, being itself the more solid it will carry off a certain portion of the fluid. Also, when similar substances, but which differ in solidity, come in contact with each other the same phenomenon may be observed. Thus, if a thick fatty ink be placed in contact with a quantity of the same ink to which more oil has been added, the more solid of the two absorbs and carries off a portion of the more fluid.

If one dip one's forefinger into some thick ink and then press it against the thumb, half of the ink will be found to stick to each finger. But if the thumb have been previously dipped into water (if the ink experimented with be thick water-colour), or into oil (if an oil-colour be used), then by simple contact and pressure no colour will be left on the thumb until after the ink upon the finger has been thoroughly mixed by rubbing with the more fluid matter upon the thumb.

It is upon the foregoing peculiarities of affinity of solid for solid that the production of water-colour impressions from lichtdruck plates is based. The ink used for this purpose should contain very little moisture, nor should there be so much colouring matter as to counteract the adhesive power of the gum. The advantages offered by the use of water-colours in lichtdruck are considerable, and demand investigation.

Since the ink only contains water and glycerine in the shape of moisture, but no oil, varnish, or resin, the ink cylinders themselves moisten the gelatine film of the printing plate while blackening it, so that no other damping seems to be required, and every intermediate manipulation is rendered superfluous. My experience has been that up to a hundred impressions may be pulled one after another without the plate requiring to be separately damped, and it may be assumed with a considerably degree of certainty that the number might be yet further increased.

The damping has given rise—even in the case of the lithographic Schnell-press—to many difficulties, and has greatly complicated the arrangements of the press, so that the productiveness of a lithographic Schnell-press is not nearly equal to that of a cylindrical letterpress Schnell-press. But let the necessity of damping for lichtdruck be wholly done away with, then a Schnell-press of much simpler construction might be introduced, and thereby a great advance would be made by this lichtdruck process.

Every experimentalist is apt to let himself be carried too far by his sanguine hopes, and often finds quite unexpected difficulties come in his way. Here, however, there was nothing to mislead me, except, perhaps, the single circumstance that the whole number of impressions I have pulled without damping has never exceeded a hundred (because I had not only to make all the experiments myself, but even when doing the actual printing at the press I had no assistance, nor was there any within call). But he who would produce his lichtdrucks in this way, and thinks of getting special presses made for the purpose, would require to be sure of getting two or three hundred impressions from a plate without damping before it would be worth his while.

Another advantage of this method is that the colour does not spoil the stone nor the cylinders, nor does it, like varnish colour, require to be scraped off next morning. If the ink become somewhat dry it may be made usable again with glycerine. Then the colour dries very little upon the stone; while the prints are pretty dry when they come out of the press, as the paper absorbs the glycerine. The disagreeable exhalations caused by the use of oil of turpentine, so indispensable when printing with varnish colours, is quite done away with, and the stone, the rollers, the knife, and the hands can all be quickly and easily cleansed by that cheap purifier, clean water.

The printing plates for use with water-colours are prepared in the usual manner; but very fine prints may also be obtained from plates perfectly free from grain, since the ink feeds textureless plates as well as granular plates with its moisture by rolling. If it be possible to fasten the gelatine film to an elastic linen band, as in Despaquis' lichtdruck Schnell-press, then my water-colour ink is eminently suited for printing it. The same rollers that are used for varnish colours may also be employed for water-colours, only for some days before being used for the latter they must be frequently coated with glycerine until they cannot absorb any more.

To prepare this ink, which we shall call "water-colour ink," proceed as follows:—Take three parts of gum arabic and add as much water as will produce, after standing twenty-four hours and frequent stirring, a very fluid solution, which filter through rags. Then add two parts of glycerine, and evaporate the mixture until white fumes appear. The latter are an indication that no superfluous water is present, but that already the glycerine is evaporating, though not burning. In this condition the gum, which appears a tough and viscous mass, may be kept without spoiling for years, and may be used as an addition to any given pigment, just as oil or varnish is employed. The best pigment is the finest lampblack and a little *caput mortuum* (of the dark violet kind). This colouring matter, previously rubbed down with water as finely as possible, is added to the above-described gummy mass and well mixed with it with a pestle. The superfluous water is then evaporated off by stirring the ink with a knife upon a hot piece of sheet iron until white fumes rise. When cold the ink is very solid, and may be diluted according to taste with glycerine.

It is not easy to determine the proportions by weight of the colouring matter to the gum, as these vary according to the kind and properties of the colouring matter, and must be specially ascertained for each sort employed; but the dose may be determined by certain signs, namely, the ink must give sufficiently powerful shadows; if these are too weak, even should the ink be rather solid, more colouring matter must be added. Should the adhesiveness of the gummy mass be interfered with by the addition of too much colouring matter, then a little more gum must be added. In this way the proportions of any desired colouring matter to the gum may be determined in numbers.

If a lichtdruck plate is to be printed from in water colours it should be damped, as usual, with water and glycerine, or that mixture may be poured over the plate. In a few minutes, when all the parts of the gelatine plate shall have become sufficiently moist, the solution should be wiped off, and glycerine alone, without any addition of water, must be poured upon the plate and left a quarter of an hour, after which it also should be wiped off. The plate is then perfectly prepared for printing purposes.

To facilitate the blackening, cut off a piece of the ink, moisten it, and rub it over the stone, and then roll it well. The first blackening of a lichtdruck plate gives no good results. The rollers, as well as the gelatine film, which have been previously soaked with glycerine, contain too much moisture, which they impart to the ink, and the ink, thus become too thin, covers every part of the gelatine picture. The first two or three prints (which are made upon dry paper, partially absorbing the superfluous moisture of the film) are very flat, without either depth or high lights. But if the operation be repeated once or twice, and each time fresh, solid ink be used, the time will come when the moisture of the ink, the rollers, and the gelatine film will all be suitably proportioned, and when the prints will appear with the proper lights, depth, and quantity of ink. *From that moment damp paper must be used for printing upon*, as the gelatine film can no longer spare any moisture to the paper. By using dry paper the gelatine film might be dried up until the ink should stick fast over its whole surface, and would leave a deep black smear on the whole print. Should such a thing happen by accident it is only necessary to roll longer than usual; the gelatine film will then gradually take on fresh ink, and at last the picture will be developed in all its details. From that time forward it is possible to go on printing without any intermediate manipulation, all that is required being to ink and to pull.

When the ink is of the proper consistency, and goes on to the rollers smoothly, the work proceeds much more rapidly than by the ordinary lichtdruck processes, and one gets very clean prints, which in beauty and appearance are in no respect different from those produced with varnish ink. Also, these water-colour prints, though finished and ready for use whenever they come from the press, may, like ordinary lichtdrucks, be further glazed and mounted if desired.

If the gelatine solution have a third part of alcohol added to it it may be transferred without any pencil work; but if one prefer to place the pictures in the gelatine solution, as in a bath, then the alcoholic addition may be omitted. When the stratum of gelatine is dry the glaze is produced by pouring the varnish (particularised in Herr Husnik's book) already described over the pictures in the neighbourhood of a warm stove.

Whether the pictures are varnished or not they are as permanent as the ordinary lichtdrucks, and withstand even damp without fading. If, however, one rub continually at one place with a wet finger pressing upon the picture, then the colour gives way. But such treatment no prints could withstand, for the paper itself would suffer, especially if it were chalk paper; so that, on the whole, a water-colour print is no more liable to injury than a varnish colour picture. J. Husnik.

—*Photographisches Archiv.*

THE ART OF PAINTING ON THE PHOTOGRAPHIC IMAGE.

No. IX.

The following list of materials will, I think, be found sufficient for general work in oil on the photographic image:—About two dozen hog-hair brushes, ranging from Nos. 1 to 9, the largest number being of the small sizes; of No. 3 you might have six, as being the most wanted. Of these brushes there are two shapes—the flat and the round; the use of either seems a matter of taste, but personally I prefer the flat ones, as nice touches can be got with the edge and corner sometimes. Have half-a-dozen sable brushes of different sizes, and a good large badger hair "softener." To these may be added a camel's-hair flat brush in tin, three-quarters of an inch broad—also to be used as a "softener" for small work.

As to the medium for painting with: there are tubes sold in the shops ready prepared—all good, but in large practice I have found a mixture of equal parts of drying oil, turpentine, and copal varnish the best. It dries well, and with a good gloss—both good things in painting a photograph where time is often, unfortunately, of the utmost importance.

A mahl stick for resting your hand on will probably be required, and an easel. Of the latter, I can strongly recommend a kind known as the "corbould." It is large enough for good-sized oil paintings, and for small work there is a loose desk fitted to it and fastened with screws, than which nothing can be better or more luxurious; it can be used at any angle, and at any height, and as you sit at a small opal or miniature you may sit upright, and not bent in an unhealthy attitude. A tin box, with false perforated bottom, two-thirds filled with turpentine, is handy to have at your side to clean a small brush in if you do not wish to change, using it, indeed, somewhat like your water jar in water-colour painting. Have a palette knife and palette—the latter large enough. I prefer them of some dark wood as contributing to the mixing of forcible tints. Some, I know, prefer light ones—more like the colour of the ground they are going to paint upon; and no doubt much may be said in their favour that appears reasonable, but from my own experience I am partial to the dark wood.

The following list of colours is sufficient for all ordinary purposes:—Get of ivory black, flake white, and raw umber a large tube each, and in the ordinary small sizes the following:—Antwerp blue, French ultramarine, cobalt, ultramarine-ash, vermilion, crimson lake, madder-carmine, Venetian red, Indian red, Roman ochre, raw sienna, burnt sienna, cadmium, yellow ochre, chrome yellow, Naples yellow, *terre verte*, brown madder, sepia, burnt umber, lemon yellow, brown pink, emerald green, purple lake, and Vandyke brown.

If you wish to do an oil picture in the cheaper style or tinting you should proceed much as in water-colour, only using medium instead of water. Take raw sienna, vermilion, and madder-carmine and mix in proportions to produce the kind of complexion you wish. Pass all over the face and hands, floating a little colour with rather less medium into the cheeks, and introducing a little thick colour—say raw sienna, white, and a touch of Venetian red—into the high lights on forehead and nose. Then tint the hair all over with black, French ultramarine, and Venetian red, mixed so as to produce a neutral bluish tint. Now paint the middle tints their proper colour—black for black, sepia for dark brown, Vandyke and Venetian red for auburn, Roman ochre and burnt umber for golden, and so on—warming up the deep shadows with some rich brown or orange. The background, if even, may be treated in the same transparent manner; but if not even it must be done with opaque colour. In the former case a transparent glaze of raw sienna deepened with burnt sienna towards the bottom corners will often suffice. JOSEPH WAKE.

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THE LATE W. H. FOX TALBOT.

ON the death of Mr. Talbot our contemporary, *Nature*, among other periodicals, contained an article on the departed *savant*. This elicited the following note from Mr. J. Smith, of Park House, Kew:—

IN your account of the death of Mr. Fox Talbot, you state that he first entertained the idea of the art of what is now called photography in 1833, and that it was not until 1839 that he and Daguerre first made known the principles of photography under the name, I think, first of Daguerrotype, followed by Talbotype. I therefore think the following notes concerning Nièpce may interest some of your readers:—

I cannot now from memory give exact dates, but I think it was at least ten years previous to 1839 that there lodged in a neighbouring house to where I now reside a Frenchman of the name of Nièpce; he was, I think, engaged on a perpetual motion machine. He died, which necessitated his brother coming from Paris to Kew. The brother was a theatre scene-painter, and had discovered the art of fixing upon metal the pictures of objects reflected by the sun. On arriving at Kew he put up at the "Coach and Horses" inn, then kept by Mr. Cusel, and not being able to speak English, Mr. Cusel introduced him to Mr. Francis Bauer, the celebrated botanical artist, then residing at Kew. Nièpce had brought with him three pictures, specimens of his discovery, which he showed to Mr. Bauer, who became much interested in them. He deemed the discovery worthy of being made known to the Royal Society; but as the method of obtaining the pictures was not described in the notice sent to the Society they would not entertain it, and nothing was done in the matter. Nièpce returned to Paris, leaving two of the pictures with Mr. Bauer, and the third with Mr. Cusel in part payment of his bill, he being a poor man. Being a frequent visitor to Mr. Bauer, the latter naturally called my attention to the two pictures that hung in his room for at least ten years. In time Nièpce let the secret of his discovery become known to M. Daguerre, and in 1839 this discovery came before the public under the name of "Daguerreotype," and about the same time "Talbotype" was announced." This led Mr. Bauer to write a letter to the *Athenæum*, fully explaining all particulars of what I have here stated from memory. In his letter Mr. Bauer said he should be happy to show the pictures to those interested in the subject. Consequently he had many callers, one of the earliest being Dr. Percy, whom I remember coming to me, wanting to know where he could find Mr. Cusel, who had then retired and was living at Richmond. Dr. Percy went off to Richmond with the intention of buying the picture; but I remember telling him Mr. Cusel would not sell it, as he was not in need of money. Such was the case, as Mr. Cusel told me some time after "that he would not sell it; no! not if he was offered £100 for it." Mr. Cusel is long since dead, and what became of his picture I know not. After Mr. Bauer's death, in 1840, these two pictures came into the possession of his friend, Mr. Robert Brown, and I believe are now in the British Museum.

The communication of Mr. Smith has been followed by a second article in *Nature* of last week, which we reproduce, as it introduces matters of historical interest of a character different from that with which we dealt in our own account of Mr. Talbot's discoveries:—

HAD the photographic art never been invented Mr. W. H. Fox Talbot, whose death we recently recorded, would have a claim to take a good rank as a scientific investigator. In the popular estimation his work in connection with photography is what alone gives him a claim to remembrance; but we are sure there are many of our readers who must be familiar with writings by him in various departments of science. He was indeed in many respects a wonderful man, and a glance at the Royal Society's catalogue will show that he has left behind him a great amount of varied work. In mathematics, in physics, in chemistry, in astronomy, in botany, in archæology, in literature, Fox Talbot at various periods of his life did substantial work, and in addition filled faithfully and liberally the responsible position of an English country gentleman on his estate of Lacock Abbey, Wiltshire.

Fox Talbot was the eldest son of Mr. William Davenport Talbot, his mother being a daughter of the Earl of Ilchester. He was born in February, 1800, and received his early education at Harrow. Thence he went to Trinity College, Cambridge, where he gained the Porson prize in 1820, was Chancellor's gold medallist, and graduated in 1821 as twelfth wrangler. Just after the passing of the first Reform Bill he sat for two years in Parliament as member for Chippenham, when he retired from public life, and devoted himself almost entirely to work in various departments of science and literature. In the Royal Society's catalogue alone is a list of about fifty papers by him in various domains of science, and ranging from the year 1822, the year after his graduation, down to 1872. The first paper on the list is a mathematical one contributed to Gergonne's *Ann. Math.* (1822), *On the Properties of a Certain Curve Drawn from the Equilateral Hyperbola.* In 1822-23 he contributed six mathematical papers to the same journal, one of them being *On a Curve the Arcs of which Represent Legendre's Elliptic Functions of the First Kind.* He was the author of at least eight other mathematical papers contributed to the Royal Society, the *Phil. Trans.*, and the *Transactions* of the Royal Society of Edinburgh. Some of these papers are very remarkable, as those on *Definite Integrals*, and show Fox Talbot to have been a mathematician of no small power.

He seems to have commenced his researches on light at an early period. There is, for example, in the *Edinburgh Journal of Science*, for 1826, a paper describing *Some Experiments on Coloured Flames;* and in the *Quarterly Journal of Science*, for 1827, one *On Monochromatic Light.* Other papers in the same direction appear in the *Phil. Mag.*, for 1833, *On a Method of Obtaining Homogeneous Light of Great Intensity—Experiments on Light*, 1834—*On the Nature of Light*, 1835. In 1861 he published in the *Chemical News* papers on *Early Researches on the Spectra of Artificial Light from Different Sources*, and *Some Experiments on Coloured Flames;* and so late as 1872 we find in the *Proceedings* of the Royal Society of Edinburgh *Notes on Some Anomalous Spectra—On the Early History of Spectrum Analysis*—and *On a New Mode of Observing Certain Spectra.*

In chemistry, as might be expected, his researches were many, being mainly connected, however, with photography. One of his earliest chemical papers will be found in the *Philosophical Magazine*, ii, 1833—*Remarks on Chemical Changes of Colour.* We find other papers contributed mainly to the *Philosophical Magazine* on nitre, iodide of silver, iodide of mercury, &c.

In January, 1839, Daguerre published his account of his process. On the 31st of the same month Fox Talbot gave an account of his own process to the Royal Society, in a paper entitled *Some Account of the Art of Photogenic Drawing, or the Process by which Natural Objects may be made to Delineate Themselves without the Aid of the Artist's Pencil (Roy. Soc. Proc.* 1839; *Phil. Mag.* xiv. 1839); and at the meeting of the British Association that year he read a paper on the subject. From that time onwards he continued to write papers in connection with his invention, though for several years before his death he seems to have lost his interest in the subject, and turned his versatile intellect to other lines of inquiry.

The original photogenic drawing is nothing more nor less than the silver printing process of the present day, which has received little or no modifications since it passed out of his hands, unless it be the application of albumen to the paper and the fixing with sodium hyposulphite. Early in 1840 a new process due to Talbot created a sensation in scientific circles, the results being a marked advance on everything that up to that time had been produced. This was no other than the calotype or "beautiful picture" process—a patent for which he took out dated 1841. The main features of this process may be described as the production of a photographic picture on sensitised silver iodide, held *in situ* in the pores of paper, and its development by means of gallic acid. The credit of the discovery of this method of development has often been ascribed to Fox Talbot; but we believe that to the Rev. J. B. Reade it is really due, but was so modified by Fox Talbot as to render it manageable in the hands of the operator. The next patent that Fox Talbot took out was registered under the title of "Improvements in Calotype," in which, amongst other things, he included fixing the photographic image on the paper by means of sodium hyposulphite—a solvent for the haloid salts of silver which Sir John Herschel had used in February, 1840.

The third patent taken out by Talbot, in conjunction with Malone, was for the use of unglazed porcelain in lieu of glass on which to support the photographic image, using an albumen process. In this patent, also, we have a protection granted for an invention which has several times since been rediscovered, viz., the use of a transparent and flexible support in lieu of glass capable of being adapted to a curved surface, by which means a panoramic view might be taken in the camera by the gradual rotation of the lens round its optical centre. This flexible support was paper rendered transparent and non-absorbent of the liquid albumen applied to its surface. The last novelty included consisted of an application of photography to the production of an image on steel plates, doubtless with a view of helping the engraver.

The fourth patent was for a process (described in the *Athenæum*, December 6, 1851) by which instantaneous pictures could be taken, and was so sensitive that an experiment undertaken at the Royal Institution to prove its value is worthy of redescription. Printed matter was fixed on a wheel which was caused to revolve at a rapid rate, and being illuminated by the spark from a battery of Leyden jars, a *facsimile* of it was produced in the camera, "every letter being perfectly distinct." We doubt if at the present day any greater degree of instantaneity could be secured even by the most rapid collodion processes extant. The success of the process was due to the extreme sensitiveness of silver iodide when prepared by double decomposition of the iron salt, and also to the great facility with which silver nitrate could be reduced by ferrous sulphate. The debt he owed to Dr. Woods, of Parsonstown, and to Robert Hunt, who respectively discovered these facts, Talbot duly acknowledged in his communication to the *Athenæum*.

The last patented invention in photography with which Fox Talbot's name is connected was that of photographic engraving. This process is based on the discovery by Poitevin of the possibility, by exposure to light, of forming an image in gelatine when impregnated with bichromate of potassium. The steel plate on which the etching was to be engraved was covered with a dried layer of thin chromated gelatine, and after exposure in the camera the plate was placed in cold water to remove part of the gelatine and as much of the bichromate as possible. It was then covered with the etching fluid which penetrated in a greater or less degree through the gelatine film, and the "biting-in" thus effected enabled the plate when inked up and printed in the usual manner to give an impression on paper of the object photographed. This method was most successful in the reproduction of line engravings, and when half-tones had to be produced he adopted other artifices to which we need not here refer.

It has been stated that Fox Talbot did not protect his processes, but the above list of patents at once contradicts the assertion. Not only did he—as we think quite justifiably—do so, but he strictly claimed his rights, even going so far as to bring an unsuccessful action for infringement, claiming to include in his calotype patent—which was essentially a paper process—the collodion process of Le Gray and Archer. Mr. P. Le Neve Foster writes to us that Fox Talbot was so tenacious of his rights that the formation of the Photographic Society was for a time prevented. "I had," Mr. Foster writes, "more than one conversation with him at that time on the subject, and he only yielded, and in favour of amateurs, after much solicitation on the part of the late Lord Rosse and Sir Charles Eastlake, who thereupon became the first president of the Photographic Society."

The accompanying extract from the correspondence which appeared in *The Times* of August 13, 1852, between the inventor of the calotype process and the presidents of the Royal Society and Royal Academy, shows the spirit in which the two latter approached the subject of the patent rights, and the generous tone in which the former responded:—

> "The art of photography on paper," Lord Rosse and Sir Charles Eastlake write, "of which you are the inventor, has arrived at such a degree of perfection that it must soon become of national importance; and we are anxious that, as the art itself originated in England, it should also receive its further perfection and development in this country. At present, however, although England continues to take the lead in some branches of the art, yet in others the French are unquestionably making more rapid progress than we are. It is very desirable that we should not be left behind by the nations of the continent in the improvement and development of a purely British invention; and, as you are the possessor of a patent right in this invention which will continue for some years, and which may, perhaps, be renewed, we beg to call your attention to the subject, and to inquire whether it may not be possible for you, by making some alteration in the exercise of your patent rights, to obviate most of the difficulties which now appear to hinder the progress of art in England. Many of the finest applications of the invention will probably require the co-operation of men of science and skilful artists. But it is evident that the more freely they can use the resources of the art the more probable it is their efforts will be attended with eminent success. As we feel no doubt that some such judicious alteration would give great satisfaction, and be the means of rapidly improving this beautiful art, we beg to make this friendly communication to you in the full confidence that you will receive it in the same spirit—the improvement of art and science being our common object."

This letter is dated "London, July," and Fox Talbot replied as follows, under date "Lacock Abbey, July 30":—

> ". . . . I am as desirous as any one of the lovers of science and art, whose wishes you have kindly undertaken to represent, that our country should continue to take the lead in this newly-discovered branch of the fine arts; and, after much consideration, I think that the best thing that I can do, and the most likely to stimulate to further improvements in photography, will be to invite the emulation and competition of our artists and amateurs by relaxing the patent right which I possess in this invention. I therefore beg to reply to your kind letter by offering the patent (with the exception of a single point hereafter mentioned) as a free present to the public, together with any other patents for improvements in the same art. . . . The exception to which I refer, and which I am desirous of keeping in the hands of my own licensees, is the application of the invention to photograph-taking for sale to the public. This is a branch of the art which must necessarily be in comparatively few hands. . . . With this exception, then, I present my invention to the country, and trust that it may realise our hopes of its future utility."

In the *Philosophical Magazine*, iii., 1833, will be found a very curious paper, which might interest Sir Wm. Thomson (who, however, has probably read it), *On the Velocity of Electricity; a Proposed Method of Ascertaining the Greatest Depth of the Ocean.* Crystallography and optics came in for a considerable share of Talbot's attention. In 1836, in the *Comptes Rendus*, we find him describing researches on borax crystals, and besides various papers on the subject mentioned produced in 1836, he gave the Bakerian lecture of that year, the subject being *Facts Relating to the Optical Phenomena of Crystals.* In 1842 he read a paper at the British Association *On the Improvement of the Telescope*, and another in 1847 *On a New Principle of Crystallisation.* He describes in the Astronomical Society's *Memoirs* (xxi.) a total eclipse of the sun, July 28, 1851, observed at Marienburg, Prussia, and in the British Association Report for 1871 will be found a paper by him *On a New Method of Estimating the Distances of Some of the Fixed Stars.*

The subject of heat also had its attractions for his many-sided mind, and in 1836 he contributed to the *Philosophical Magazine* papers on the *Repulsive Power of Heat* and on *Radiant Heat.* Even botany received a share of his attention, for we find in the *Transactions* of the Edinburgh Botanical Society for 1868 a *Note on* Vellozia eleganz *from the Cape of Good Hope.*

But the half is not told, and it would take up more space than we can spare, even were it quite appropriate in these pages, to refer to his numerous contributions in literature and archæology to the Royal Society of Literature (of which he was vice-president), the Society of Biblical Archæology, and by other methods. Orientalists will call to mind that Talbot was one of the first who, with Sir Henry Rawlinson and Dr. Hincks, deciphered the cuneiform inscriptions brought from Nineveh. He was the author of several books of much interest and learning, and in his *Pencil of Nature*—a fine quarto published in 1844, and probably the first work illustrated by photographs—he describes the origin and progress of the conception which culminated in his invention.

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OPINIONS OF THE LONDON DAILY AND WEEKLY PRESS ON THE PHOTOGRAPHIC EXHIBITION.

Photography.—The Photographic Society of Great Britian has collected this year, at 5a, Pall-mall East, a large number of good specimens of photography. One or two of the best English photographic artists are conspicuous by their absence; but the show is on the whole a remarkable illustration of the progress of an art which only dates from 1839. Nièpce, the French scene-painter, and the better-known inventors, Talbot and Daguerre, had been upon the track for some time; but in that year the detailed proof that the fleeting images in the camera obscura could be fixed startled the world. Mr. Le Neve Foster has described the wonder and delight with which the mysterious plates produced by M. Daguerre were handed about by scientific people. Shortly afterwards the late Mr. Fox Talbot publicly exhibited his photogenic drawings, followed by his grand invention of the Talbot-type, or, as he named it, "calotype." The Photographic Exhibition was commenced in 1854; and this year the managers have had, from want of space on their walls and screens, to reject about 200 pictures. The catalogue numbers run up to 565, but in many cases one entry comprehends several pictures. Thus "No. 542, photographs taken during the Arctic Expedition under Sir G. Nares, lent for exhibition by the Lords of the Admiralty," would in the ordinary way of cataloguing be Nos. 542 to 649, for there are 107 of these Arctic pictures, forming a complete pictorial diary of the last gallant and unsuccessful attempt to reach the Pole. The series begins with a group of natives at Egedesminde, in Greenland, and a view of the expedition at anchor in the harbour of Disco. At Cape York, 76° north latitude, we first see the *Discovery* made fast to the ice. Then comes the ice-foot, Arctic glaciers, and ice worn into beautiful shapes left aground by the falling tide. A view is given of the walrus killed in Franklin Pearce Bay—a fierce sea monster, who would have made the fortune of any aquarium if he could have been taken alive. In the winter quarters we are shown young ice, which is black, and other ice, which is hoary apparently with age. The photograph has preserved for us the theatre, smithy, and skating rink in which the long Arctic night was beguiled. In latitude 81° a seam of coal, 25 feet thick, is shown—a striking testimony to the change in the climate since the time when the trees thus fossilized were fed with sap, flourished, and fell. The photographs are creditable to the skill of those who took them, whether by the midnight sun or other light in those high latitudes. As works of art they are inferior to the picturesque views of icebergs and Arctic rocks which Mr. Bradford brought back from a journey to the north in 1869; but they form a faithful record, compiled under great difficulties, of the bleak and desolate scenes in which the least difficult part of the expedition's task was pursued. There are some other excellent Arctic photographs by Mr. Grant, who went out with Captain Sir Allen Young in the *Pandora*. From Dantzic, Philadelphia, Lisbon, Algiers, the Cape, New York, Carlsruhe, Switzerland, and Japan, contributions have come to the Exhibition. Dr. van Monckhoven, of Ghent, has sent some admirable reproductions in photography of old stonework—a branch of art with which photography is peculiarly fitted to deal. Herr Feilner, of Bremen, has a large collection of spirited photographs of actors. Among pictorial photographs an interior by Mr. Robinson, of Tunbridge-wells, in which an old cottager and his wife are represented sitting in their kitchen on a summer evening, at once attracts attention. Photographs of lake scenery by M. Bowness; of Mont St. Michel, by Stephen Thompson; of Welsh hills, by Mr. Robert Crawshay, of Cyfarthfa; and of splendid trees in the park of Knowle, by the Royal Engineers' School of Photography, taken under the direction of Captain Abney, are good examples of the artistic selection of points of view, and the latter of perfect execution. The Autotype Company exhibit a carbon enlargement of a study of Glen Sheire, Inverary, by Mr. Vernon Heath; and Colonel Stuart Wortley has many clever studies of wave and cloud. The use of photography in science is shown by an enlargement to 100 times its original size of the tongue of the honey-bee, made by Mr. Edward Viles. *A Yokohama Belle*, by Mr. Valentine Blanchard, is a delightful costume portrait. Sir Thomas Parkyns exhibits "a new process—permanent colours." The mode of producing the photographs is not described. At present the effect is much the same as if an ordinary photograph were printed on toned paper. Several photographs are exhibited which have been taken on Warnerke's sensitive tissue—a very portable substitute for the glass plate. The negative taken on this material in a hand camera on a tripod, which folds up into an alpenstock, may be sent home by the tourist by post, and developed at once into a picture. On the table is a series of vitrified photographs, Hogarth prints and other pictures transferred to china and baked-in, a process which, if developed, might give us copies of works of high art to gaze upon at the dinner-table. The subject is a tempting one for discussion, but we have not space to do it justice.—*The Times*.

THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The annual Exhibition of this Society, which is now open to the public at 5A, Pall Mall East, illustrates the immense progress which the art of photography has made during the last few years, and is altogether, with regard to the general high degree of excellence attained, the most satisfactory collection of sun-pictures yet brought together. As there are upwards of five hundred numbers in the catalogue, and as many equally meritorious works were, we understand, shut out for want of space, it is evident that this Exhibition is thoroughly appreciated by the professors of the art, whether amateur or professional, native or foreign. Without further prelude let us plunge at once into the catalogue, and begin by remarking on the capital work executed by the Royal Engineers' School of Photography, as, for example, in the two large pictures of the great Beech Tree and the Oak, Knowle Park, the former of which is an untouched silver enlargement. Messrs. Stillfried and Andersen, of Yokohama, send some characteristic samples of Japanese architecture, foliage, and people. Mr. Robert Crawshay, of Cyfarthfa Castle, a veteran amateur, exhibits some specimens of Breconshire scenery, very soft in effect. Mr. William England, whose Swiss photographs are so widely known, is represented here by numerous examples, remarkable for their extreme distinctness of definition. These are from dry plates. Next we have Colonel Stuart Wortley, whose photographs of sea and shore are so highly appreciated. Of course there is a certain amount of device about his "moonlight" effects, since "that orbed maiden with white fire laden" does not, like her big brother, the sun, do anything in the art way. Photography serves many useful purposes nowadays. For instance, it is a potent *aide-de-camp* to the scientific lecturer, as witness Mr. Edward Viles's enlargements of microscopic objects, such as a honey-bee's tongue, or a blue-bottle's proboscis. The *Pandora* Arctic expedition is effectively illustrated by Mr. W. J. A. Grant's photographs. Next comes a frame which will delight mammas—Messrs. R. Faulkner and Co.'s instantaneous portraits of children. There are scores of them here, and the expressions are delightfully natural. Next we come to a foreigner, Bernard Mischewski, of Carlsruhe, whose portraits are remarkable for their excellence, especially those on a large scale, taken with a Dallmeyer 6A lens, after fifty or sixty seconds' exposure. Mr. A. Boucher, also a foreigner, though domiciled at Brighton, exhibits some capital work in the way of portraiture. Nor must we forget in this connection Mr. Valentine Blanchard, one of the Vice-Presidents of the Society, who exhibits some excellent portraits—one, for example, of Valentine Bromley, the promising young artist who was cut off so prematurely last spring; and another a head of Lear, the model for which was an old Frenchman, well-known to frequenters of the Strand, where he goes about bareheaded, selling oranges or newspapers. Photographs which aim, by a careful arrangement of figures and accessories, at depicting an incident such as a *genre* artist might choose for his pencil, are apt to fail, except on a small scale, and with comic subjects; there are exceptions to this rule, however, and at least three examples of this class in the exhibition attain a high degree of success, namely, Mr. H. P. Robinson's old couple resting after the day's work—a thoroughly Faed-like study; Mr. R. Slingsby's *Alone*—a girl seated on a sandhill by the sea; Mr. Samuel Fry's birdstuffer surrounded with specimens—a subject recalling Mr. H. S. Mark's peculiar humour. Returning to portraits for a moment, we would call attention to those of Taeschler, and also point out Feilner's *Characteristic Heads of an Actor*, interesting as showing the sitter's command of facial expression. Mr. Carlo Relvas, too, a Portuguese amateur, sends some good work both in portraiture and landscape. We have left out dozens of names equally deserving of mention, but space presses us, so we will in conclusion merely advise our readers to visit for themselves this most interesting Exhibition, not forgetting finally to look at No. 433, in which frame the Woodbury Company exhibit their process of surface printing from metal plates. The curious thing is that, on pressure being applied, the gelatine, which seems so soft, makes an impression on the pewter plate, which seems so hard, so that the latter can be printed from. The same phenomenon certainly obtains among human beings, for a soft, gentle woman often makes a very decided impression on a man who seems as hard as nails.—*The Graphic*.

EXHIBITION OF THE PHOTOGRAPHIC SOCIETY.—Many years ago, when the Coliseum—that in the Regent's Park, not its namesake at Rome—was an institution, there was a rival, though a humbler, exhibition in its vicinity known as the Panorama. This latter building still survives, though it has long been turned to other purposes than those of amusement. In the days of which we speak the magic lantern was a very poor show indeed, dissolving views were in their infancy, and the oxy-hydrogen light was as yet unknown. At the Panorama, however, rare and, as it then seemed, marvellous effects were shown in sunset and moonlight scenes; but the speculation was unfortunate, and the proprietor, shaking the dust of perfidious Albion from his feet, returned to *la belle* France. In after years his name was world-famous, for Daguerre has been universally admitted to share the honour of the invention of photography with our Henry Fox Talbot. True it is that some Dryasdusts claim the primal idea for Josiah Wedgwood; but the claim is too nebulous, and the proofs are too vague, for serious consideration. The art has grown apace, and Daguerreotype and Talbotype have long been superseded by an infinity of processes, without, however, reaching the goal of colour reproduction. The present exhibition, nevertheless, fully shows the marvellous development and the progress, both in an artistic and mechanical sense. Taking the first number in the catalogue, not only for its priority but also intrinsic excellence, we must give the palm to the very superb panorama of the *Centennial Exhibition Grounds and Buildings*, from the *atelier* of Mr. Gutekunst. The artist has taken his point of view from George's Hill, and with rare skill has reproduced the myriad buildings clustered in Fairmount Park in the past year. Speaking from personal experience the present writer can speak to the fidelity of the view and to the ability with which the difficulties of representing so extensive an area have been so successfully overcome. The focus is everywhere preserved—a result which will be regarded by experts as a marvel when we say that this view is obtained by printing from no less than seven negatives, and that it is impossible anywhere to note the points of junction. Nor has Mr. Gutekunst been less successful in his portraiture, the large head of *Professor Longfellow* being the most characteristic likeness we have seen of the poet. Picturesque England and Ireland have fared equally well at the hands of Mr. Payne Jennings, of Dublin, some of his views, notably of the Dargle, Glendalough, and Killarney, being most artistic, the difficulties of the foregrounds being set at nought, and the half-tones being most luminously rendered. Mr. Brownrigg, also of Dublin, a distinguished amateur, also represents the beauty of Irish scenery with much skill. Mr. Gutekunst and Mr. Jennings were awarded diplomas and medals at the Philadelphia Exhibition; we are not quite sure with regard to Mr. Brownrigg, but if he did not obtain these distinctions he certainly has fully merited them. It is impossible in a catalogue of some seven hundred frames to enter into a detailed account of the several exhibits; we therefore shall, with as much brevity as possible, note some of the more remarkable specimens. The Royal Engineers' School of Photography at Chatham contributes some eighteen large landscapes, mainly woodland scenes, all excellent. Mr. Stephen Thompson has a most charming series of foreign views, amongst which, we think, some interiors in the Vatican and the Pope's Private Garden will have much interest for our readers. The Swiss views (dry plate) of Mr. William England are all admirable; and Mr. W. P. Frith, of Reigate, has two exquisite wet collodion plates of *Canterbury Cathedral*—one the exterior of the glorious fane with the Bell Harry Tower, the other the interior of Trinity Chapel, with the tomb and armour of the Black Prince; and, if our memory serve us, the tombs of Henry IV. and his Queen Joanna. Mr. Vernon Heath's very fine *Glen Sheire, Inverary,* has been reproduced in a carbon enlargement by the Autotype Company, which also contributes a number of remarkable works printed in permanent pigments. Mr. Forhead, of Ventnor, and Mr. Milman Brown, of Shanklin, illustrate well the Isle of Wight; and Mr. F. Beasley, jun., in addition to exquisite views of *Steephill Cove* and the *Keep, Carisbrook Castle,* represents the varied and glorious scenery of Devonshire and Cornwall. The beauties of artist-beloved Bettws-y-Coed are treated by Messrs. Lisden and Sons, and Mr. C. V. Shadbolt, and the charms of Guernsey and Sark are well represented by the camera of Mr. T. R. Hutton, of the first-named island. Dr. van Monckhoven, of Ghent, displays several remarkable enlargements printed in carbon, all distinguished by delicacy of demitone; and Mr. Edward Viles heads the scientific list with microscopic enlargements to the extent of 200 diameters. From Japan comes quite a gallery of Japanese landscapes, subjects and objects, technically excellent but specially interesting as illustrating the costumes and peculiarities of old Niphon, now so rapidly passing away. Messrs. Stillfried and Andersen, it is to be hoped, may still continue their field of researches. But the present exhibition will be notable for the comprehensive series of photographs taken during the last Arctic expedition from the *Alert, Discovery,* and *Valorous,* lying in Disco Harbour, to a view of the *Palæocrystic Sea* taken in April, 1876. The Lords of the Admiralty have lent no less than 107 plates, arranged in order from the starting-point at Disco, through the gamut of higher latitudes, until the furthest point of exploration is reached, in the camp in Westward-Ho Valley, lat. 82 deg. 35 min. Mr. W. J. A. Grant also contributes a number of Arctic views, subjects, and groups of great interest. Before leaving the field of landscape we must take exception to Colonel Stuart Wortley's *Studies of Waves and Clouds;* we can do this the more frankly as the gallant amateur's reputation is so fully established with the general public that it seems almost heresy to doubt. The moonlight effects are of the lime-light *coulisses,* and the breaking waves without an exception are woolly and blurred. The intention is admirable, but the execution wretched. Truth to say the camera does not lend itself to composition, and with but one exception the picture subjects are failures. The exception is the *Alone,* by Mr. R. Slingsby, of Lincoln, the pose of the figure being graceful and unstrained, and the landscape adjuncts artistically treated. Portraits, it is unnecessary to say, are in a large majority. Mr. Valentine Blanchard shows an excellent likeness of the late Mr. Valentine Bromley and a study of the venerable *Echo Boy,* known to all frequenters of the Strand. Herr Feilner, of, if we mistake not, Hamburg, presents a number of portrait subjects luminous in the lights and graduated in the shadows, and Herr Mischewski, of Dantzic, must also be noted for the pictorial beauty of his studies. In the entire series of portraits there is nothing in our opinion that can compare with the instantaneous portraits of children taken by Messrs. R. Faulkner and Co., of Baker-street. Unforced, and natural to a degree, they are the only photographs we have ever seen that have succeeded in arresting the evanescent and ever-changing expression of infancy. In the purely-mechanical processes there are excellent examples of heliotype, produced by lithographic ink from blocks, and surface printing from metal plates in gelatinous ink, undistinguishable from solar printing, the production of the Woodbury Company. Amongst the "curios" we may mention the Autotype reproduction of the *Common Place Book* of John Milton and some *fac-similes* of ancient manuscripts. The copies of crayon portraits, by Mr. G. Piercy, of Pall-mall East, are undistinguishable from the originals, and the gelatine lantern slides of Mr. W. B. Woodbury, of Lower Norwood, may yet revolutionise an important branch of industry. All who have albums (and who have not?) must have regretted their dilapidation and the deterioration of the *cartes;* the new revolving album of Mr. G. Hare, of Calthorpe-street, will therefore be welcomed as effective for preservation and ingenious and simple in construction. For all those whose time hangs heavy on their hands, and all who have an hour to spare, no more agreeable pastime can be recommended than that at 5, Pall-mall East.—*Tablet.*

APPLICATIONS FOR NEW PATENTS.

February 8, 1877.—"Construction of Stands or Supports for Holding Photographic Albums, Ladies' Companions, and other like Articles. No. 539."—H. Lemann and G. A. Hasler.

February 15, 1877.—"Easel Albums for Exhibiting Photographic Pictures. No. 628."—J. C. Koch.

March 1, 1877.—"Improvement in the Method of, and Apparatus for, Treating Photographs and other Articles of Paper so as to Render them Transparent. No. 826."—W. Brookes.

March 31, 1877.—"Improvements in Photography relating to the Production of Photographic Pictures on Woven Fabrics. No. 1264."—W. Winter and C. D. Abel.

April 2, 1877.—"A New or an Improved Method, or Process, of Producing Coloured Photographs. No. 1284."—F. C. Schuhmacher.

April 7, 1877.—"Improvements in Photography as applied to the Preparation and Treatment of Pellicular Negatives, Transfer Pigment Printing, Pigments, and Pigment Paper, and in Appliances to be used therefor. No. 1367."—J. R. Johnson.

April 21, 1877.—"Production of Coloured Photographs. No. 1560."—G. Schneider and G. W. Van Nawrochi.

April 27, 1877.—"Photographic Apparatus. No. 1647."—W. B. Woodbury.

May 5, 1877.—"Improvements in Photographic Printing and in Apparatus employed therein. No. 1757."—E. Greaves.

May 5, 1877.—"Photographic Printing Frames. No. 1758."—E. Greaves and J. Smith.

May 7, 1877.—"Production of Photographic Relief Plates, or Photo-electrotypes for Printing. No. 1773."—W. H. Mumber.

May 15, 1877.—"Photographic Apparatus. No. 1891."—B. J. Edwards.

May 17, 1877.—"Photographic Lenses. No. 1938."—F. von Voigtlander.

July 23, 1877.—"Apparatus for Exhibiting Photographic or other Pictures. No. 2809."—J. C. Koch.

August 24, 1877.—"Chromotype and Autotype Photographic Printing, and Colouring of Tinting the Same. No. 3222."—Sir T. G. A. Parkyns.

September 14, 1877.—"Photographic Apparatus. No. 3461."—D. Scotellari.

October 4, 1877.—"Application of Photography to the Production of Relief on Celluloid. No. 3703."—L. A. Boulé, A. P. Blin, E. G. Brewer, and E. L. Tishe.

Correspondence.

SUGAR AND TREACLE IN GELATINE EMULSIONS.

To the Editors.

Gentlemen,—I am glad to see that you agree with me as to the good effect of sugar or treacle in gelatine emulsions.

I mentioned the idea of rendering the gelatine more permeable to the developer as that which first led me to try these substances. I do not desire in the least to hold to that as the true or only cause of the improvement. I have learned a little since that time; and I can see that your explanation may be the right one, and that the effect is due to the organifying action of the sugar or treacle.—I am, yours, &c.,

Ipswich, October 20, 1877. G. Morton.

GELATINO-BROMIDE EMULSIONS.

To the Editors.

Gentlemen,—In reply to Mr. Herbert B. Berkeley, who, in your last issue, has alluded to the statement that in my experience with gelatine emulsions I have always obtained the best results without a chloride in the emulsion, because it generally gave dirty images, and on that I based the opinion I gave in my paper. I am still of the same opinion that chloride of silver attracts moisture from the atmosphere. All chlorides attract it more or less.

I have always found in drying chloride of silver residues that after the filter paper containing it has been thoroughly dried, and is allowed to lie exposed to an atmosphere that is at all damp, it readily absorbs the moisture.—I am, yours, &c., W. Brooks.

Reigate, October 24, 1877.

SPOTS AND FREE CRITICISM.

To the Editors.

Gentlemen,—The letter in your last number by Mr. G. T. Moore I consider to be in the worst possible taste, and a very clumsy attempt at wit. I have had a considerable amount of experience in all kinds of emulsions, and in my humble opinion Mr. Brooks has given the correct explanation of the principal causes of spots in negatives.

There may be, and I think it likely there are, other sources not enumerated by Mr. Brooks, but I have no doubt he is, in the main, perfectly correct as far as he goes, and I consider him entitled to thanks for the trouble he has taken.

Mr. Moore's remarks as to the impossibility of alkalies and acids floating in the atmosphere are perfectly ridiculous. Did Mr. Moore never spill any hypo. solution, nor let fall any crystals of citric acid on the floor of his dark room, and is not the dust from these disseminated through the room by the motion of the feet? A similar question might be asked as to nitrate of silver. Did not Mr. Moore ever pulverise that substance in a mortar within a few feet of the spot where he prepares his dry plates? If he have failed to commit either of these errors he is a more careful man than photographers in general.

As regards Mr. Moore's query as to the analogy between certain processes: if he cannot comprehend Mr. Brooks's remarks his mind must be singularly obtuse.—I am, yours, &c., BAYNHAM JONES.

Cheltenham, October 22, 1877.

[To the occasional eccentricities of the post, unpleasantly experienced in connection with our last issue (see notice at head of "Answers to Correspondents" of last and present issue) we are indebted for having been unable to say, by way of append to Mr. G. T. Moore's letter of last week what we now say, namely, that this gentleman is entirely in error in imagining that Mr. Brooks "ventured to throw ridicule" upon either our own labours in endeavouring to diagnose the cause and the nature of spots in washed emulsion films or those of other scientific investigators, for, on the contrary, he tendered his fullest acknowledgments to ourselves and other investigators. Will Mr. Moore, whom we believe to be a skilful emulsion worker, kindly give us his ideas as to the causes of these spots, seeing that he ridicules the idea of their origin having as yet been discovered?—EDS.]

EXCHANGE COLUMN.

Wanted, good *carte* or cabinet rolling-press, in exchange for pictures.—Address, M. WILSON, 5, Keith-terrace, High-road, Lee, S.E.

A Steinheil's No. 4 aplanatic doublet will be exchanged for a No. 1 wide-angle rectilinear by Dallmeyer.—Address, GEO. HADLEY, 27, Alexandra-terrace, Lincoln.

I will exchange a 15×18 negative glass bath and stand and a whole-plate bellows camera for anything useful in photography.—To be seen at A. WARD'S, 54, Brixton-road, S.W.

Wanted to exchange, one or both Ross's orthographic lenses, 12 and 14 focus, for a wide-angle or $8\frac{1}{2} \times 6\frac{1}{2}$ water-tight bath. Difference adjusted.—Address, G. SCHOFIELD, Heaton Mersey, near Manchester.

Two hundred numbers of THE BRITISH JOURNAL OF PHOTOGRAPHY from 1874 up to the present time, and one hundred numbers of the *English Mechanic*, in exchange for a good $\frac{1}{4}$-plate camera.—Address, JAMES EDWARDS, Brora, N.B., Sutherland, Scotland.

ANSWERS TO CORRESPONDENTS.

PHOTOGRAPHS REGISTERED—

Latham and Bott, Longton.—*View of Hawarden Castle.*

John Robertson, Dundee.—*Three Views of Tay Bridge.*

George Albert Broadbent, Huddersfield.—*Portrait of Rev. H. P. Liddon.*

W. Currey, Bolton.—*Two Portraits of John Bright, M.P.*

W. Usherwood, Dorking.—*View of St Martin's Church, Dorking.*

George F. Roger, Dundee.—*Group of Rev. Father Holder and Rev. Father McDairmid.*

☞ *Correspondents should never write on both sides of the paper.*

⁂ The postal authorities not yet having recovered the letter lost *en route* to the printer, of which we made mention last week, we have to request those correspondents who, during the week before last, have written to us without receiving a reply through the Journal to favour us by repeating their queries or communications.

F. D.—Make use of an alkaline developer.

J. E. G.—We shall make inquiries, but at present we are short of information.

W.—No special handbook is necessary, although such are published in America.

H. C. COGSWELL.—The portraits do you much credit; they are well printed and mounted, and the posing also is good.

LIGHT.—Dr. Monckhoven's work is the best that is devoted to the subject of enlarging by means of the solar camera.

GEORGE WATERSON.—The license for an amateur is not five pounds, but five *shillings*, to cover the cost of stamp and registration.

SUBALTERN.—Burn to ashes all the cuttings and other paper waste; mix with it some carbonate of soda and nitrate of potash, together with a little borax, and fuse it by a strong heat.

B. D.—There are two gentlemen, both photographers, of that name; but from your note we had no difficulty in deciding for which of them it was intended, so we addressed it accordingly.

F. WRIGHT.—Tracing cloth of the kind to which we alluded may be obtained from Waterlow and Co., or from any stationer who makes a speciality of supplying architects' drawing materials.

ARCHITECTON.—This correspondent inquires if the Vanderweyde system of lighting studios, about which there was so much talk two years ago, has come into general use. He has not heard of any who have adopted it other than those whose names were mentioned in this Journal at the time.——We reply: neither have we. The system, however, is quite sound, especially in the case of one or two sitters. With regard to groups its advantages are not apparent.

GEORGE ROWE.—Let the *carte* be lighted from *two* directions instead of one, and the effect of texture will be greatly diminished in the copy, if it do not altogether disappear. The light should fall upon the print from two opposite directions.

L. D.—While the microscopic enlargement is executed in a manner reflecting credit upon your photographic abilities it is far from being as sharp as it should be. A clue to your failure in this respect will be found in the fact of the best microscopic objects not having their actinic and visual foci coincident.

A. M. B.—Our correspondent asks—"What is the difference between chromotype, Lambertype, and autotype prints?" In reply we refer him to the *Autotype Manual*—a valuable little book, which ought to be in the possession of every one who is even sufficiently interested in carbon work as to ask the foregoing question.

H. G. ROGERS.—1. The heliotype process has been patented in this country, but not, so far as we can learn, in Italy.—2. We have been unable to ascertain whether or not Herr Albert's process has been patented in Italy; no patent for it exists in this country.—3. The address required is *The Manor House, South Norwood, London.* The change of address has been duly noted.

F. O'B.—In making use of only one plano-convex lens as a condenser for a magic lantern it is imperative that the flat side be placed next to the flame, and also that its radius of curvature be such as to make it a "bull's eye." If two lenses of similar form (plano-convex) be employed, let them be mounted with convex surfaces next to each other. In this latter case the lenses must not possess such violent curves as when only one is to be used.

THE PHOTOGRAPHIC EXHIBITION.—We have received several letters directing attention to slight errors that are to be found in the catalogue of the Exhibition, some of which are rather irritating, others sadly confusing. These existed to a much greater extent in the first edition of the catalogue than in that which is now being issued. The picture, No. 70, by Mr. Vaughan, of which we spoke last week, is not, it appears, from a "wet" plate, as our remarks would lead one to infer, but is from a *dry* plate.

G. P.—The subjects, with perhaps one exception, will be well adapted for lantern transparencies. We advise you to print them in the camera by the wet collodion process, making use of a sample of collodion somewhat old and red coloured. It is probable that better results would be obtained by making use of the albumen, or collodio-albumen, instead of the wet collodion process; but we should not advise you to make use of these, at first, for the intended purpose until you have mastered the details of manipulation and toning. Assuming that you are already quite familiar with the wet collodion process, we recommend it in preference to the others.

J. C. STENNING.—Our correspondent, alluding to our observations on his pictures in the Exhibition, says:—"I see you refer to my photographs in the Exhibition as done with Kennett's pellicle, basing your information on the catalogue, which has grossly blundered, as I took pains to send a duplicate list of the particulars of the prints. The interiors are done by Kennett's pellicle, and the rest by Liverpool emulsion. I have written to the Assistant-Secretary to ask him to make the necessary correction in a future issue of the catalogue. It does not matter to the photographic public a bit by what process they were done, but I am vexed at the blunders made."

H. G. INSKIPP.—It is gratifying to receive letters of the character sent us by this correspondent. Through the instructions in this Journal he believes he has arrived at a tolerable degree of proficiency in emulsion dry-plate work, and has long ago discarded the bath altogether. He encloses some prints for our opinion as to how far his work is "up to the mark." We have to state, in reply, that they are unmistakably excellent, and indicate the high degree of proficiency attained. The aperture of the lens employed is $\frac{f}{22}$, and yet with exposures of respectively less than half-a-second, two, three, five, and ten seconds (the last on a dull day), fully-exposed negatives have been obtained.

J. A. W.—It seems almost incredible that in a town like yours ferridcyanide of potassium cannot be obtained. However, one must not expect too much of young colonial towns. It will not be difficult to prepare this salt from the *ferrocyanide*, which we understand you to say is plentiful. Make a solution of this latter salt, and when cold add to it nitric acid very gradually and with constant stirring, until a drop of the mixture ceases to impart a blue colour to a solution of sesquichloride of iron. Then evaporate and crystallise. Before putting yourself to the trouble of preparing the salt, you should inquire further for it under such aliases as red prussiate of potash, ferricyanide or ferricyanuret of potash. It may also be prepared by dissolving ferrocyanide of potassium (one part) in water (ten parts), and passing slowly through this solution a stream of chlorine gas until the liquid appears of a deep reddish-green colour.

ERRATUM.—In our leading article on *Substitutes for Glass in Landscape Photography*, in our last number, page 494, line 26 from top of first column, for "washing" *read* "waxing."

RECEIVED.—Sir Thomas Parkyns; Payne Jennings.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—The next meeting of this Society will take place on Thursday next, November 1st, in the Rooms of the Society of Arts, Adelphi, when a communication will be made by Mr. T. J. Pearsall, F.C.S. Subject—*Educational Aid by Photographic Exhibits.*

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 913. Vol. XXIV.—NOVEMBER 2, 1877.

SPOTS ON WASHED EMULSION PLATES.

We feel constrained to return once more to this subject in consequence of the article of Mr. J. Dudley Radcliffe in our last number, which appears to us to be based upon an entire misconception of the nature and cause of the evil, while the theory involved is, to say the least, open to very grave doubt.

Referring to the previous article of Mr. W. Brooks, describing three distinct forms of spots, Mr. Radcliffe says—"Nos. 1 and 2 may be passed over without comment, as they are due to careless manipulation." It is so far satisfactory to find that the cause of these general pests is traceable to no more formidable source than "careless manipulation;" but it is at the same time eminently unsatisfactory that, in spite of all the care and research which have been bestowed upon the subject by the principal emulsion workers, we are still unable to say in what particular form of "careless manipulation" the now well-known circular transparent spot (No. 1) has its origin. We are strongly of opinion that none of the numerous varieties of spots are to be "passed over without comment," but least of all No. 1; and we shall be glad if Mr. Radcliffe can point out the particular direction in which we are to exercise greater care in order to overcome it. We have an idea, however, that he will find it a more difficult task than he appears to believe, and that he will end by giving No. 1 the first place in importance, as Mr. Brooks and others have done.

The writer then proceeds to treat of the third or opaque variety mentioned by Mr. Brooks, and states in no uncertain terms that "black spots in an emulsion plate are caused by the emulsion from which the plates are prepared containing particles of *nitrate* of silver in suspension." Particles of nitrate of silver *in the film* we have not the slightest doubt *are* capable of producing the result mentioned; but we do not venture far enough to assert, as Mr. Radcliffe does by inference, that this is the sole cause. That gentleman, however, goes on to describe an experiment by which the correctness of his view may be proved, and we shall endeavour by first attacking his proof to show the entire fallacy of his explanation.

Briefly stated, his directions are to expose one half of a plate to light, when, upon development, if the inducing cause be present the exposed half only will show the spots. His explanation of the immunity of the unexposed half is that the particles of silver are "wrapped up" in the film and protected from the action of the developer; exposure to light, however, enables the developer to "overcome the mechanical obstruction," and black spots are the result. We have then an entirely new action of light totally distinct from its actinic or chemical action; it is capable of modifying the physical character of the film in such a manner as to render it permeable to the developer when not so otherwise. This also involves the existence of a new property in films of gelatine and collodion (for both are mentioned), namely, impermeability to aqueous solutions until submitted to the light's action.

Now, we think there are few of our readers who will be disposed to accept this theory unchallenged. A film, to be photographically useful, must be freely permeable to the developer, both before and after exposure; and the merest tyro in dry-plate work will know that such being the case, and supposing the presence of minute particles of silver nitrate locked in the film, contact with an alkaline developer will cause instantaneous blackening, whether the plate be exposed or not. We say "supposing" the presence of particles of nitrate, because we shall have more to say presently as to the probability of such presence.

Mr. Radcliffe states in the first paragraph of his article that he does not agree with Mr. Brooks's opinion of the origin of these spots; we shall now, however, try to show that while his own theory is not supported by the experiment he quotes, that of Mr. Brooks is quite in accordance therewith. The latter gentleman attributes the evil to *dust* of silver (mark the "dust") or of an alkaline agent, the former making itself evident upon contact with ammonia, the latter immediately the pyro. alone is applied. Mr. Brooks does not speak of unexposed films, and therefore has no occasion to make the statement that the silver spot would appear quite independently of the action of light, nor has he the opportunity of explaining why in Mr. Radcliffe's experiment the unexposed portion of the plate would show a less liability to spots, supposing the inducing cause to be an alkaline substance. We may be allowed, then, to make the necessary explanation.

Bromide of silver combined with collodion or gelatine, as in a photographic film, is not acted upon or reduced by alkaline pyro. until it has been submitted to light, unless the proportion of alkali be much greater than is ordinarily employed in development. Hence it would follow that in the event of the film becoming dusted with minute particles of a feebly-alkaline substance, such as the sesqui-carbonates of ammonia or soda, or perhaps of lime, the effect upon the unexposed portions of the plate would be simply *nil*, owing to the absence of one element necessary to reduction, namely, exposure to light. If, however, a strongly-alkaline developer were used, the slight increase of alkalinity might prove sufficient to bring about spontaneous reduction, while in the exposed portions the greater strength of the alkali at the points of contact, together with the increased density given by bromide of silver which has been treated with alkali previous to exposure, would combine to form spots of greater opacity than the general character of the film. Thus, to our mind, it would appear that Mr. Radcliffe has brought forward an argument in favour of that portion of Mr. Brooks's theory with which he does not agree, and even proving that his own view is incorrect.

Further: the allusion to the sky and most strongly-lighted portions of a negative containing the greater number of spots seems to be erroneously conceived; the reason why the spots are *more noticeable* on those portions appears to be because the broad, even tint of the sky renders them more distinct and isolated than they are amongst the broken lights and shadows of the other parts of the picture, while the element of exposure probably tends to increase the number.

If any further argument were necessary to prove the untenability of the theory advanced, we have only to turn to the emulsion itself and consider its nature, the methods by which it is prepared, and the probability, nay possibility, of its containing "particles of nitrate of silver in suspension." In the old system of sensitising the nitrate of silver was added to the collodion in powder, and thoroughly mixed either by vigorous shaking or by grinding in a tube mortar until fully decomposed. Under this system it was perhaps possible that the emulsion, if used before the full decomposition had taken place and without proper filtration, might contain undissolved particles of silver nitrate.

If a film prepared from an emulsion in that state were treated, without previous washing, with an alkaline developer, then there is not the slightest doubt that black spots would be produced. Such a result, however, was seldom or never met with previous to the introduction of washed emulsions, because the soaking in several changes of water which was necessary before applying the organifier effectually removed the undecomposed nitrate. Now, if we consider that the nitrate is soluble to the extent of several grains to the ounce in collodion, it is plain that this state of affairs (minute particles of silver remaining in suspension) could not exist for any length of time, as the suspended particles would be dissolved and diffused equally throughout the whole bulk of emulsion; hence, if spots arose from the cause mentioned by Mr. Radcliffe, it could only be through gross carelessness both in allowing insufficient time in sensitising and also incomplete washing.

If we turn to washed emulsions the probability of the emulsion containing undissolved or suspended particles of silver becomes even more remote. Considering that the silver is added to the collodion in the state of solution, and bearing in view the very thorough washing which the "pellicle" must undergo before drying, it becomes absolutely impossible to imagine that a single particle of undissolved nitrate could pass through the ordeal and find its way into the final emulsion; and even then it could not long withstand the solvent action of the alcohol. This, we think, fully disposes of the idea of suspended particles in the emulsion.

As we have remarked, and as Mr. Brooks also states, spots may be caused by dust of nitrate of silver becoming attached to the film after it is spread upon the plate. This, though a possible cause of the mischief, is not likely to be of very common occurrence; indeed, we are inclined to attach comparatively little importance to it. Black spots occur, however, under circumstances which entirely preclude the possibility of any connection with silver nitrate. The only occasion upon which we have been seriously troubled with them was during the past summer when working away from home and entirely clear of all chemicals, except the bottle of emulsion from which we coated each day's supply of plates; yet, on an average, two plates out of three exhibited traces of the defect.

The most curious feature of the case in this instance was that the same emulsion failed to produce a like result after our return home. We were puzzled to account for the eccentricity; but, after carefully studying the whole circumstances, we obtained a clue to what we now believe to have been the cause, and, though we are far from asserting it to be the invariable cause, we give it as one which may be added to the list of those already mentioned.

We may explain that a short time previous to the trip in question our dark slides underwent a thorough overhauling, including the cleaning, scraping, and, of course, revarnishing of the interior portions. The plates exposed were removed from the slides each evening and replaced by freshly-prepared ones. These were coated and reared up to dry spontaneously in the bedroom before retiring, and as soon as dry were placed in the slides. Now it seems to us probable, in spite of the most careful dusting of the slides both before and after revarnishing, that particles of dust of *mahogany* may have remained lodged in the shutter grooves and other parts of the slide and become attached to the surface of the plates in consequence of the shaking they necessarily underwent. It is also possible that the spontaneous desiccation of the plates was in some cases incomplete; and these two causes combined would sufficiently explain the whole matter, if it can be shown that the extractive principle of mahogany is capable of exercising a deleterious action. That this is so needs but one experiment. Dust a small quantity of mahogany scrapings on to the surface of a newly-coated plate and put it away in the slide until dry; development (after exposure—we have not tested it on an unexposed plate) will prove but too plainly the reducing action of the wood dust.

In conclusion: let us express our opinion that none of the many descriptions of spots can be traced to one single cause. The particular form under discussion we have proved experimentally to be produced by alkaline substances by reducing agents of various descriptions or by nitrate of silver—the last-named being the least probable cause. In the manner described by our correspondent, Mr. Radcliffe, we have endeavoured to show that silver cannot possibly so act.

EFFECTS IN PHOTOGRAPHS.

In an obscure position on the back of a screen in the present Photographic Exhibition is to be seen a frame containing several pictures by Sir Thomas Parkyns, respecting which the catalogue affords no other information than that they are illustrations of "a new process—permanent colours." These pictures have all the appearance of having been printed upon strongly-tinted paper, being uniformly grey, pink, or other colours in the whites, and the cursory observer would at once attribute their appearance to the cause we have indicated; but an announcement is affixed that no coloured paper has been employed, and hence we are at liberty to conceive of other methods by which such effects may have been produced.

But, in the first place, and previous to suggesting methods by which such monochromatic pictures might be produced, we may state that excellent and varied effects can be obtained by imparting a tint to the picture. For example, and to compare one thing with another, it is known that when a bright, sparkling, sunlit scene in nature is viewed through a glass of a strong green colour it immediately assumes the aspect of a moonlight scene; a red glass employed in a similar manner converts the scene into one suggestive of a sultry midsummer in Calcutta or some other tropical region; while blue glass immediately brings down the landscape to a cold, wintry tone, enough to chill the observer by its suggestiveness. Effects of a like character can be produced by the simple act of dyeing the photograph by any convenient pigment, such as the aniline preparations now so easily obtained under the form of Judson's dyes.

To try the effect produced upon the mind by colours, we some time ago printed six landscapes on albumenised paper and immersed them, in succession, each in a different solution of the "dyes" just mentioned. The effects were, indeed, exceedingly diversified and full of interest. We are much mistaken if some large and famous Venetian "moonlight" photographs exhibited in London three years ago were not produced in the manner indicated. It is necessary that the photograph be coated with albumen, gelatine, or some similar body, as the result is not satisfactory when perfectly plain paper is employed. This precaution is more requisite in the case of carbon prints than in those on albumenised paper, because the former are capable of being produced on unsized paper, which would be quite prohibitive in obtaining a good result through the agency of the aniline dyes.

But when we remember that brilliant and beautifully-coloured films are easily formed by the addition of certain dyes to collodion, we see a method by which an even tint could be applied to carbon prints. Our readers generally, and the members of the South London Photographic Society in particular, will remember that at one of the meetings of that Society, early in 1874, Mr. John Spiller read a paper *On Colouring Matters Suitable for Tinting Films*, and that in an editorial article at the time we directed attention to the simple manner in which certain collodion films had been coloured, namely, by either mixing one or other of the aniline colours with the collodion or by coating a glass plate with plain collodion, allowing it to set, rinsing with water, and then applying the preparation of aniline. Bearing in mind the beauty and perfection of the coloured pellicles thus obtained, the inquiry is suggested whether by the methods indicated a suitable colour might not be imparted to the collodion film which at the present time serves to "face" so many of the small carbon prints, especially portraits, which are now being produced. By imparting a tint to the collodion forming the substratum upon which the carbon print is transferred and developed, it will be evident that this tint will affect the appearance of the print after it has been attached to its final support, and the collodion film which was formerly the substratum has assumed the position of the superstratum or external covering of the image.

The method employed by Sir Thomas Parkyns is at present unknown to us, for it forms the subject of a patent which has not yet arrived at the termination of that probationary course of six months previous to which its special characteristics cannot be ascertained. We have no desire here to enter into any speculations as to its nature, for when the ordinary course of its secret existence as a patent has been run, full details concerning it will be open to the public, which will be in the course of a few months. But we may be allowed to state that if it be based upon the facing of a carbon print with coloured collodion, instead of the plain collodion hitherto employed for this purpose, it will form a most excellent method of securing the effects aimed at; for, while capable of easy application, the method is such as to give perfect uniformity, at the same time being entirely under the control of the photographer.

NOTES OF EXPERIMENTS WITH ALBUMEN.

A MAIN disadvantage attending the study of photography in an exact manner lies in the uncertainty and want of uniformity which prevails regarding the constitution of some of the chief materials employed in its practice, foremost among them being albumen, whether it be made use of either on paper or on glass. We have lately been making a few experiments with the idea, if not of endeavouring to ascertain its exact ultimate constitution, at anyrate to take from it such substances as might be injurious, and to procure as uniform a product as possible.

The great varieties to be met with in commercial samples of albumenised paper, and the occasional uncertainty which besets their working, would lead one to suppose that what might be termed the foreign matters must exert a varying influence upon the albumen itself according to the length of time it had been prepared, and our idea was to endeavour to discover and eliminate them. Our experiments were confined to the albumen of eggs. This, when freshly taken from the eggs, has an alkaline reaction; but if anyone take the trouble to apply a piece of litmus paper to any albumenised paper in the market he will find it redden immediately. This, however, may be the effect of additions made by the manufacturer rather than the result of decomposition; for it is, or used to be, a common practice to add a rather large amount, comparatively speaking, of acetic acid to every batch of albumen for the purpose of making it flow freely upon the paper and dry without streaks. We allude to this more especially seeing that in a well-known work on photography it is stated that albumenised paper has an alkaline reaction. If such were the case, a new element of uncertainty would arise in the difficulty of accounting for the action of the albumen in causing the bath to become acid, which, as is well known, always happens with a bath in frequent use for sensitising paper.

Upon trying the effect of exactly neutralising the albumen we could not perceive any practical difference; and though on theoretical grounds the addition of excess of acetic acid to the albumen is to be deprecated, we yet could not find in the results of our experiments any practical objection, so far as regards the finished results, to a method which, for technical purposes, no doubt the manufacturers find to possess advantages they could not gain by other known means. At the same time we decidedly failed, in the necessarily limited course of our experiments, to discover any real advantage in the use of acid; and we think it quite as likely as not that it is one of those relics of former practice which are retained without any sufficient reason for their continuance. This, as we all know, is of common occurrence in the affairs of everyday life. Still it can never be too much taken into account that what we may call "laboratory experiments" often fail or are found wanting in some important point when put to the test in large operations.

Many are the plans of great promise from which inventors have anticipated the realisation of vast fortunes, which, when tried in the laboratory with scrupulous care and rigid exactness, have been a complete success, but have utterly failed when put into practice on a large scale, and with only that help which manufacturing operations allow—that is, an ordinary labourer, as he may be termed. Fortunately, however, for photographers most of their operations are performed by themselves or under their immediate supervision, and there are but few things for which they are dependent upon others; hence we say that though we did not see the use of acid it may yet be of advantage. We have, however, a theoretical objection to its use, which we believe to be well founded.

The flowing qualities of albumen, it is well known, are much improved by the addition of ammonia, and an experiment we tried, from which we anticipated some novel results, was the addition of ammonia to the albumen before floating. But whatever good effects it might have were entirely neutralised by a great practical objection that was discovered at the very outset of our experiments—the fluid instantly sunk into the texture of the paper, penetrating to the back at once, and giving a peculiar, greasy appearance similar to that presented by paper when its sizing has been removed by boiling. The paper, when dried, was dull and dead, and altogether so unsatisfactory that we at once desisted from experiments in this direction.

Our next step was to obtain some albumen in as great a state of purity as possible. We obtained from a well-known manufacturer of paper half-a-gallon of freshly-prepared egg albumen from the freshest eggs, and sent to us the moment it had cleared after the beating, &c., to which the freshly-extracted whites are subjected. We put one half of this in a large dialyser and placed it to dialyse in a vessel of distilled water, which latter was changed three times in twenty-four hours. A very remarkable change was produced. The liquid first began to be turbid, and finally settled in a thick, insoluble, yellowish-white, amorphous mass upon the parchment and the walls of the dialyser. After collecting the whole products from the dialyser and mixing them we were reduced to the necessity of using acid to dissolve them, owing to the effect of ammonia as above described. Briefly, the results we obtained from paper prepared with this mixture did not appear to show any advantage to result from the innovation. But this is just one of those cases where the manufacturer could step in and try on a more extensive scale than is possible with ourselves the effect of the change we indicate. It is not likely that any loss would be suffered, and results of some importance might accrue.

Some experiments have been made lately by a continental experimentalist upon the properties of albumen freed from salts as much as possible (we presume by dialysis). They were said to become strongly opalescent upon the addition of alcohol or on boiling; in many cases the solution became turbid, and even threw down precipitates. Ordinary albumen, we need not say, at once coagulates when so treated. Further: pure albumen was said to behave in no respect differently from that form which occurs in white of egg. The same writer was inclined to think that the precipitation of albumen by salts was probably only a physical action. His remarks upon dialysed albumen are interesting, though we cannot say they are entirely corroborated by the results of our own experience. After stating his inability to offer a decided opinion as to the normal reaction of albumen after a long process of dialysis, he says he has often obtained albumen showing an acid reaction when the same albumen originally contained alkalies or alkaline carbonates; but such solutions he has shown to contain globulin, and he imagines that the acid reaction may be due to those substances which act as solvents of globulin. Pure albumen he believes most probably has a neutral reaction.

Phosphorus is always found, just as sulphur is, in egg albumen, and is considered now by many to form an essential part of it, and not an accidental accompaniment—Schmidt, for instance, believing albumen to be maintained in solution by earthy phosphates. This would be a ready means of accounting for the insolubility produced by dialysis, as we have described in our own experiments.

THE PHOTOGRAPHIC EXHIBITION.

[FOURTH NOTICE.]

WHEN Pat, on the evidence of two witnesses, had been convicted of assault, his characteristic reply to the judge was—"Be jabers! yer honour! I can bring twenty witnesses who will sware that they did not see me sthrike the man." So with Mr. Stephen Thompson, who, in reply to our indication of a certain picture by him in the Exhibition being an example of "converging perpendiculars," attempts to prove us in the wrong by sending to the editor of a contemporary a number of *other* pictures which he alleges to be free from the fault in question. To distract attention from the defect we pointed out, Mr. Thompson introduces the subject of the hooded roofs of Palladio. This has no more to do with the subject than has the mottled and pinholed skies in these and other pictures by the same photographer—*e.g.*, Nos. 42 and 43. We alluded to walls which have no connection with roofs in the picture, but the convergence of which strike the eye and provoke the adverse comment of even the tyro who visits the Exhibition. It was a positive unkindness to hang these pictures in a position which has brought their failings directly under the eye of the observer; but it was much more unkind of the Fates by whom the photographer, in an evil hour, was prompted to rush into print and declare No. 25 to be "entirely free from any convergence of the lines," inasmuch as the defect forces itself upon the notice of the observer. On the subject of the distortion of convergence, generally, we may remark that such defect will be produced even with a camera carefully levelled and possessing a swing-back, unless care be taken to have the back of the camera in the same vertical plane as the buildings photographed; and it behoves those who "go in" for architecture with wide-angle lenses to be particularly careful how they use the instruments at their command.

Among the various excellent pictures contributed by Mr. Valentine Blanchard, his *Study of an Old Man* (275) commands special attention, and is probably one of the best of Mr. Blanchard's works in this year's display. His *Balmy Sleep, Nature's Kind Restorer* (239) is also a fine conception carried out in Mr. Blanchard's well-known style. It represents a child asleep on a couch.

Mr. W E. Debenham, of London, and Mr. A. Debenham, of Ryde, exhibit cabinet portraits of much excellence. Those by the former artist (240) are printed in carbon; while the latter exhibitor does not confine himself to cabinets, but contributes portraits of large dimensions. In Signor Lombardi and M. Boucher Brighton portraiture finds able representatives. Many of the exhibits of the former gentleman—for instance, No. 344, a frame containing twelve cabinet portraits—have been hung too low to admit of comfortable examination. Mr. Protheroe, of Bristol, does not this year confine himself to small portraits, but contributes several of goodly dimensions; for example, No. 284, a frame of two excellent large heads, in good proportion, although taken direct. We understand that the front lens alone of a large portrait lens was the optical "tool" employed in the production of these choice pictures. No. 361 is a frame containing eight admirable whole-plate portraits by the same artist.

Two large composition pictures are exhibited by Mr. A. Ford Smith, respectively *A Bird's Song* (131) and *Bird Nesting* (246). While there are many attractive elements in the latter, which depicts three young ladies among ferns engaged in the avocation—pastime we must not term it—of bird-nesting, it will be conceded that the former is of greater excellence, it being, indeed, a charming picture. The portraits contributed by Mr. John Hawke possess great merit, being technically very perfect. M. Klary, of Algiers, exhibits a frame of fine portraits, which attract attention from the fact of the artist's name having been prominently associated with a *brochure* on lighting the sitter, as well as from their intrinsic merits.

It is impossible to be in the Exhibition gallery without having the eye attracted to Mr. H. Baden Pritchard's picture, *Waiting To Go On* (126). It represents a pretty, innocent child in the garb of a juvenile clown, sitting in the "green room" adjoining the stage, upon which he is in momentary expectation of being called to appear. It is an enlargement from a small negative, and is an excellent picture. Mr. W. M. Harrison shows a collection (219) of very good carbon and chromotype portraits. Mr. Frith exhibits two exceptionally fine views of Canterbury Cathedral—an interior and an exterior; while Mr. F. M. Good also confines his exhibits to two pictures, these being *Flower Studies from Nature* (526-7), and which are well deserving of high praise. There is a frame of neat, small landscapes, *Views in North Wales* (195), by Mr. C. V. Shadbolt, which indicate a promise of still better things.

Of the microscopic enlargements of Mr. E. Viles it is scarcely necessary to speak, for to the visitors to the Exhibition, at least, they almost speak for themselves. We are unaware of anything microscopic having ever previously been produced or exhibited on such a large scale as his *Proboscis of a Blow Fly* (105), or the *Tongue of the Honey Bee* (107); but, certainly, as regards the excellence of their definition and the delicate softness which pervades them we have never seen them equalled. The numerous difficulties inherent in the production of microphotographs have been most successfully grappled with and overcome by Mr. Viles, who, by the production of these pictures, has achieved one of the highest positions yet attained by the votaries who have entered this fascinating field of scientific research. Mr. Viles also exhibits a noble carbon enlargement, *Portland Stone Quarries* (367), produced by the solar camera from a negative $3\frac{1}{4} \times 2\frac{3}{4}$ inches in dimensions. The detail and quality to be found in this enlargement are worthy of careful study.

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In casting about for suitable employment for the coming winter evenings doubtless many of our readers will give the production of transparencies of various descriptions the foremost place, as combining with a useful result the practice necessary to "keep their hands in" for the work of next season. In ordinary transparency printing by superposition no special appliances are necessary in connection with the light arrangements; but when for any purpose it is necessary or desirable to enlarge or reduce the image by means of the camera the subject of illumination acquires greater importance, and in some cases, perhaps, presents some little difficulty. As we speak of evening employment daylight is, of course, out of the question, and to many the lime light with its complicated surroundings is inaccessible; while the idea of employing a condenser, so necessary in producing even illumination in the ordinary manner of using artificial light, will be sufficient to deter many others from venturing upon camera reproduction. In the hope that it may prove useful to some of our readers we propose to describe a simple arrangement, the contrivance of a Russian gentleman, which was noticed in our columns about two years ago, and which requires no condensers or other complicated apparatus. It consists of a simple framework of rather peculiar shape, forming a sort of lantern, so arranged that, while securing suitable and even illumination *through* the negative, the rays emanating from the source or sources of light are entirely cut off from the lens. Imagine a figure representing one half of a regular sexagon and a tolerably correct idea will be formed of the general ground plan of the lantern. The centre portion forms a sort of background or screen from which the light is reflected through the negative. The sloping ways are made double, with a space between the two walls sufficient to hold a couple of paraffine lamps, the light from which falls upon the centre screen at an angle of about 100 degrees from opposite directions, producing a remarkably even illumination and at the same time confining the light in all other directions. If the negative to be copied be placed in the centre of the arrangement opposite to the illuminated screen there will be found little falling off in the lighting, even at the extreme edges; and though the exposures will necessarily be longer than when a more powerful light is used, this will prove a useful expedient where better means are wanting.

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SPOTS IN EMULSION NEGATIVES.

I think it very likely that Mr. J. Dudley Radcliffe has hit upon one of the causes of black spots in emulsion negatives; but I cannot understand the reason why the developer cannot get at the particles of silver nitrate when the film is unexposed to light. It seems to me that the developer can penetrate down to the glass; and yet, if the film be unexposed, it cannot reduce the silver bromide, though I should certainly say it would act upon the silver nitrate.

I can adduce cases where the "sky" of an emulsion negative has been covered with black specks, and yet the landscape has not been marred by them—indeed, they would here escape detection. But I should suppose that these spots could only arise from this cause when the emulsion has been formed with silver in excess. Again: if such an emulsion contain sufficient water or other matter in it to make it, after being poured out to set, permeable to the washing water, and the washing be continued for a sufficient time, I do not understand how the finished emulsion could yield the crop of black spots from this cause.

It has been recommended as advantageous to leave a trace of free silver nitrate in the pellicle. In such a case it is easy to understand how spots may arise; for if we use "absolute" solvents the silver nitrate would be precipitated in fine division, and would be suspended again at every subsequent shaking of the bottle. Still I should suppose that the "absolute" solvents would generally contract sufficient water to dissolve any free nitrate in the shape of a small trace of it. At the same time, if free nitrate be present, there must be also present the other soluble nitrate in even greater proportions. The presence of this nitrate, or nitrates, would probably curtail the solvent power of the little water there may be on the silver nitrate.

The *collodion cuir*, or sheet collodion, may, I believe, be obtained through Messrs. Marion and Co.; but it is, naturally, rather expensive.

With all due deference to the opinion of Mr. W. Brooks, I think it only fair to state that chloride of silver (which cannot speak for itself—at least in *English*) can behave, when properly treated, as cleanly and respectably as its near relative, bromide of silver. But it must be remembered that it is always more susceptible to the ravages of that bully—the alkaline developer. When that developer pounces on the poor chloride, armed *cap-à-pie* with alkali, the latter has a lucky escape if it survive with only a dirty face to show. But when weakly silver chloride is supported by a friendly organic restrainer it may then be safely confronted with its otherwise deadly enemy, especially when the latter has been rendered less energetic in the manner usually employed.

In fact, the whole matter is one of *comparison*. It would be about equally correct to consider that silver bromide gives "dirty images," seeing that it is more easily fogged than silver iodide. In precisely the same way do we weaken the alkaline developer for silver iodide when using it for the bromide as we do when using the "normal alkaline developer" for silver chloride. HERBERT B. BERKELEY.

NOTES ON PASSING EVENTS.

BY A PERIPATETIC PHOTOGRAPHER.

WHO at the present moment is the most ungallant man upon earth? It is Mr. John Urie, the author of a most racy set of reminiscences of studio life in Glasgow. But he speaks of women, bless them! as if they were only common mortals, and he insinuates that it is possible for some of the blessed creatures to have florid complexions and rubicund noses. In doing so he draws a picture of the way one of the fair sisterhood looked after having had her ruddy countenance well dusted with white powder to fit it for the camera, when the "protuberance," by the unlucky application of a handkerchief, became denuded of its white mask, and left the "vermilion appendage like a very red carrot protruding from a flake of snow!" The oddness of the simile provoked, I am bound to say, a hearty laugh; but when that had subsided, and I had discovered that the essayist had neither been swallowed up by an extemporised earthquake nor struck down by lightning, I recollected that a much better method of preparing a lady's *rouge-trogne* than that of applying white powder was known to a few of the fraternity. The puff-box ought to be charged, not with the usual time-honoured white powder in such common use for the purpose, but with a powder of a decidedly yellow colour. For doing away with the effect of freckles on the face yellow powder is perfection, while the degree of modification imparted even to the prominent member, when erubescent, is such as to bring it down, with respect to tint, to the subdued, even tenor of a well-ordered countenance.

The number of London newspapers who have this year "pronounced" on the photographic exhibition is, in comparison with those of last year, very noticeable. To this may, perhaps, be due the fact that on the three occasions when I have visited the gallery the attendance has been exceptionally good.

It causes me regret to say that I am quite unable *just at present* to comply with a courteously-expressed request I have received from Mr. Henry Cooper, that I should describe the method of compounding "cold spirit varnish." Every difficulty connected with its preparation has been overcome, but it does not yet possess the *biting* surface that conduces so much to the comfort of the retoucher. The addition of castor oil has been tried; but while it answers well enough in a sandarac varnish it does not appear to do so in this case. This minor requirement seems now to be on the verge of being provided, and when that has been effectually accomplished Mr. Cooper will not have long to wait until he be made acquainted with its constituents and mode of preparing the varnish.

If Mr. Keevil adopt as the objectives for his patent dissolving-view lantern those which he has figured in drawing No. 1 of his patent specification the definition of the two pictures will not be alike good. I observe in what I shall designate the "direct-vision" element of his lantern that the objective is represented by a pair of plano-convex lenses placed, one at each end of a tube, convex sides next to each other; while in the non-direct or reflecting element the objective consists of a rectangular prism having a convex surface towards the transparency. The difference in the definition of two such objectives must necessarily be great. I shall assume, however, that the patent agent or his draughtsman has not correctly drawn the combination lens—that first mentioned—and that his two plano-convex lenses are to be considered as mere synonyms for a properly-constructed achromatic portrait combination. But what, then, of the prismatic lens? Before it can project forward an image which shall be similar to that of its fellow-worker in this "dissolving" partnership, it would be necessary that the face of the prism next to the screen should be convex, and that the face next to the transparency should also be of a convex character, the *internal* arrangements of the prism being such as to ensure the projection of an achromatised image corrected for flatness of field. But as such internal arrangements would prove costly in having them properly carried out, why should not Mr. Keevil confine the function of his rectangular prism to that of a reflector alone, leaving to supplementary lenses, attached to both surfaces, the formation of the image? If a portrait lens be dissected to the extent of having its front and back constituents separated, and one of these be placed respectively upon, or in near contact with, the receptive and emergent surfaces of the prism, the difference of the image produced upon the screen by such an arrangement, when compared with that projected by the same lenses when mounted in a simple tube, will be practically *nil*. Therefore, the lenses of both objectives must be *practically* similar. I mention this because I recognise in Keevil's patent lantern an instrument which will doubtless prove to be a universal favourite when commercially introduced. I am not sure if a better way of carrying out his idea would not be found in the utilisation of two objectives in every way alike, except that in front of one of them there shall be a small bit of silvered glass, of the dimensions of the mount of a *carte de visite*, placed at an angle of 45° to the axis of the lens. This, on optical principles, *should* answer the desired purpose efficiently and economically. Let any of my readers who possess a lantern try the effect of turning its *side* to the screen (by way of experiment), and placing in front of the objective a mirror held so as to throw the image upon that screen, noting how perfect the image is, and how little it suffers from the absorption of light by the mirror.

(To be continued.)

THE ART OF PAINTING ON THE PHOTOGRAPHIC IMAGE.

No. X.

THE rest of the picture in a photograph tinted in oil is so smooth that it is absolutely necessary to have a neat, smooth background—a thing in itself not particularly artistic, and open to the accusation, no doubt, of being "tea-boardy;" but it must be in keeping with everything else.

The background, by the way, ought to be done first, and for this reason—that in doing it you are almost certain to soil the face and drapery a little; but that does not matter if they have not been painted upon, as any superfluous colour can be removed with a brush dipped in turpentine. I am speaking now of an opaque background, a good general mixture for which can be made of raw umber, ivory black, and white, mixed to a greenish tint—not too positively green, though. With this should be mixed a little medium and, if you wish it to dry very rapidly, some "drier," or "sacrum," as it is called. This can be bought in a tube, like the colours, but must be used sparingly, or the colour will dry dull, and, even if a very great excess be used, will be covered all over with a fine white efflorescence.

Now take a brush (not too large) moderately charged with this colour, and, beginning at the left-hand corner at the top of the picture, cover the whole background with it as evenly as possible adding a little darker tint towards the bottom of the picture by adding more raw umber and black, and even a little burnt sienna; then take your badger softener, and, holding it upright, dab it all over the background as a workman does when frosting a window. It is in this part of the process you will find it difficult to avoid soiling the figure. This dabbing process will produce a kind of egg-shell texture all over, very pretty, and for large things it might with advantage be so left; but if the work be small, or if you desire a perfectly smooth surface, you can now get it to any extent by lightly brushing it over with your badger softener in large work, and in small things with your flat camel's-hair brush.

The draperies may be treated precisely as in water-colour, using medium instead of gum, and may, of course, be treated opaquely or transparently. There are great facilities for destroying and avoiding hardness in oil colouring. See that the drapery is softened at its edges into the background, that the head does not cut sharply into the background, and carefully preserve any stray hairs or locks that show round it. A photograph treated in this way ought to be done in one painting, and to that end plenty of *medium* should be put into all the tints to make them bear out well. If in drying any of the tints are found to be dull, the whole thing must be gone over again with *medium*, and, if necessary, the dull parts glazed with colour. If you try to glaze one part only, you will find a troublesome blooming or dulness appear all round your tint, which cannot be got rid of. Use a little "dryers" again with this.

Having now described water colour and oil tinting, I will treat of a method of colouring a photograph that combines the two methods, and by which I have seen most excellent results produced. It consists of first painting in water colour, and then, if a plain paper or albumenised silver print, sizing it twice, preferably by floating the hot size on; then, when quite dry, going all over the picture with medium. Now examine the picture, and wherever it can be improved, work on it in opaque or transparent oil colour. Beautiful effects can be got in this manner, especially if the water colouring is effected with a due regard to what is to follow, making the deep shadows perhaps a trifle too light and warm, so as to be able to glaze them down afterwards with appropriate tints. A little impasto or thick colour may be used on the high lights of face, hair, and folds of drapery, using plenty of medium—at least sufficient to ensure its drying with plenty of gloss. These pictures may be framed, like oil paintings, with gold right up to the margin, and will bear it well, looking exceedingly rich, and combining great transparency with apparent neatness of manipulation.

A solidly-finished oil painting should be painted either upon a mahogany or oak panel, or else on canvas. Some artists pride themselves upon painting from, and not on, photographs on canvas. They trace them or get a transparency thrown on to it by a magic lantern, and run a crayon round the outline; or divide their guide into squares, dividing their canvas into an equal number, and seeing that the right parts of the picture come into corresponding squares on the canvas and on the guide. But surely these methods are, after all, mechanical; they only waste time, and there is no necessity for them, now that we can have on canvas autotypes so thin that they in no way interfere with the very threads of the canvas, nor in the least take away from the beautiful receiving properties of the prepared oil-ground; they can, moreover, be of any colour, even red, if wanted. But I, and the staff of artists assisting me at the Autotype Company's studio, prefer an umber tint. As a rule, the image is forcible enough for a ground; but in some cases—such as reproductions from bad small originals—we mark in the outline firmly with crayon, consulting our guides.

I have spoken above of the thinness of the image—a great advantage, I take it. There is no peeling off; indeed, there seems nothing to peel, only a stain, possessing as great tenacity as any paint—thoroughly incorporated, in fact, with the ground. I have lately been made aware that there exists a prejudice against autotypes on canvas, especially in Scotland, on the ground that they crack and peel off. When I first joined the Autotype Company, some three years ago, there were one or two instances of it; but since then an entirely different method has been pursued, and I have never heard of such a thing happening, although we send out large numbers every week, many of them life-sized pictures. I can, then, recommend the autotype as a groundwork even for the most expensive oil painting, and that after some experience.

There are several ways of painting a background on canvas. If time be an object you must proceed as mentioned in oil tinting, and do it at once, in one painting. One of the best ways when you have plenty of time given you is to take some raw umber and a very small proportion of white, with plenty of medium, and to roughly cross-hatch, as it were, the background all over with it, with a broad, open touch; then, when dry, glaze with raw umber, a little of black, and sufficient Prussian or Antwerp blue to make a greenish tint; and then, whilst wet, paint into this "glaze," as it is called, with bits of different colours, burnt umber, yellows, blues, blacks, &c., and here and there, where the under-tint shows too black, just crossing the place with a little colour with rather more white in it—a kind of stippling large in oil, in point of fact. JOSEPH WAKE.

THE PARTICIPATION OF LIGHT IN CHEMICAL PROCESSES.

FOR more than a hundred years the chemical action of light has been investigated by the most distinguished scientific inquirers of the day, and the facts they have substantiated are exceedingly numerous. For a considerable period these investigations were undertaken in the practical interests of photography, or, at least, were really influenced by them. Of late, however, it has been investigated more from a scientific point of view, especially with reference to the action of separate kinds of rays upon particular bodies. In general it has been found that light exercises a reducing action upon salts, but that, on the contrary, upon organic bodies it either exercises no influence at all or else it oxidises. This effect of light is especially exercised by the violet and ultra-violet rays, on which account these are specially called the "chemical rays;" yet the experiments of the last few years show that the less refrangible rays, even the red of the spectrum, produce chemical action, especially upon mixtures of organic compounds with salts. But upon the way in which the different sorts of rays, and especially the less refrangible rays, participate in chemical processes, there have been until now no definite statements upon which general laws could be based. A real step in this direction has been made by M. P. Chastaing, in a practical experiment, which he has published in the *Annales de Chimie et de Physique*, and with which we shall proceed to make ourselves acquainted.

It is a matter of course that in investigating the action of light upon various substances the attention must be directed to those bodies which absorb the light, and, as the absorption of light by certain bodies depends upon their colour, when these bodies are coloured, experiments can only be made with certain rays. Therefore in the following experiment only four sorts of rays were distinguished—the violet, green, yellow, and red; and in order to commence with the simplest cases the metallic bodies were first experimented with. An exact measurement of the photo-chemical action was seen to be impracticable here, as even with equal temperatures the actions were not proportional, and only relative measurements were furnished; it is also well known that all attempts at measuring the chemical action of the sun have as yet been fruitless. Experiments with different sorts of rays are made either by means of the spectrum or through coloured glasses; indeed, the use of spectral colours is confined to those cases in which the chemical action of the light is rapid. Where, on the contrary, the reactions take weeks or even months, recourse must be had to coloured glasses, whose powers of absorption are regularly ascertained by spectral experiments.

If white light be allowed to act upon a changeable binary compound, a reduction—sometimes rapid, sometimes slow at first—is almost always observable. In very few cases does oxidation occur, so that, on the whole, the action of white light must be considered as a reducer. With respect to the cases in which oxidation occurs, this will be shown, further on, to depend upon a secondary chemical action.

The violet and ultra-violet rays act upon a salt or a binary compound either not at all or as a reducer. In comparison with the white light the violet is much the most rapid, producing in a short time the same effect for which white light requires a long time. (This remark does not apply to silver salts, with which M. Chastaing has not experimented.) The action of the green rays appears to be little pronounced; but if one wait long enough reduction will be observed. It must, however, be remarked here that neither in the case of the green glass nor when spectral colours were used could pure green rays be thrown upon the experiment. When yellow rays are allowed to act upon the salts nothing is usually to be observed; they are known as continuating rays, and *nullify*[*] the action of the violet; but M. Chastaing tried to demonstrate that they also originate a special action which is opposed to that of the violet.[†] The same results were obtained from the red rays, whose activity is more pronounced.

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[*] Then they would not be "continuating" rays.—Ed. *Photo. Mittheilungen.*

[†] This view was also held by Herschel, Hunt, Claudet, and others.

In support of this new fact, that red and yellow rays act as oxidisers upon metallic salts and binary compounds, M. Chastaing brings a series of proofs. First the indirect one, from which he deduces that these sorts of rays increase the reducing action of the violet rays, which can only be done by oxidation; and, further, from the circumstance that the white light in which red light is active as well as violet, reduces yellow mercuric oxide much more slowly than the violet alone. Besides that, he deduces direct evidence of the oxidising action of the red and yellow rays from experiments with very easily-oxidised and reduced bodies, namely, manganic oxide, protoxide of iron, sulphate of protoxide of iron, potassic ferrocyanite, metallic arsenic, arsenic acid, hydric sulphide, sulphide of sodium, and sulphide of potassium. In these experiments, which were undertaken at equal temperatures, the chemical action that took place in the dark was compared with that produced under the violet, green, and red rays, and either the quantity of the oxygen absorbed by the salts was directly measured or, where it was practicable, the substances determined by analysis.

From the whole of the experiment (which was communicated at full length) M. Chastaing concludes that it follows that the outer ends of the spectrum act upon the binary compounds in opposite ways, so that chemical rays exist on the red as well as on the violet side. These rays are endowed with an *oxidising* or dehydrogenising power.

As the green rays lie between the blue and the yellow—that is, between the two groups having opposite actions—it was important to determine exactly to which group they really belong. Eight different reactions under green light showed that it possesses a reducing power, but of feeble intensity.

The conclusion drawn by M. Chastaing from the first part of his experiments, as shortly sketched above, runs as follows:—

"1. The chemical action of the spectrum upon the binary combinations and upon the salts is twofold—a reducing action upon one side of the spectrum, and an oxidising action upon the other. I shall, therefore, represent the photo-chemical action by two opposite curves—one the curve of reduction (that which is usually known); the other the curve of oxidation, whose existence cannot be demonstrated upon a peroxide or perchloride, and so on, but whose action can only be recognised and measured on easily-oxidised and imperfectly-oxidised bodies."

(This does not apply to the silver haloid salts. In a pure condition these are reduced by light, even as far as the ultra red, so that they give alkaline and acid-developed negative pictures. If the yellow and red rays only be oxidised, then, according to M. Chastaing, they could produce no effect whatever upon pure bromide of silver. Also the reduction of carbonic acid in the light does not agree with that theory.) —Ed., *Photo. Mittheilungen.*

"2. The reducing chemical action is much more pronounced than the oxidising chemical action. Variations of intensity are produced by the condition of the sky.

"3. The green rays are feeble in chemical power, and act like the violet, indigo, and blue.

"4. From these two opposite chemical actions it follows that there must be a point in the spectrum where the participation of the light in the production of chemical action is null; that is, that at that point of the spectrum the chemical action is the same as in the dark.

"5. This point, which I call 'the neutral point,' lies between the lines D and E at the junction of the green with the yellow."

(This occurs exactly at the point where Dr. Vogel has observed a vey intense action upon pure and coloured bromide of silver.)—Ed., *Photo. Mittheilungen.*

The few exceptions which are to be adduced to these rules are, as M. Chastaing further shows, only due to secondary chemical processes. As an example, we shall mention that under the influence of violet light sulphurous acid is changed into sulphuric acid, and thus oxidation takes place. This reaction takes place, however, where there is no air, and with precipitation of sulphur; therefore, as no oxygen is added, the first action of the violet rays is to reduce the sulphurous acid to sulphur and oxygen, which, being then in a nascent state, combines with the unreduced remainder of the sulphurous acid to form sulphuric acid.

When once the comparatively simple case of the action of light upon the metallic salts had been thus settled, M. Chastaing went on to investigate the organic compounds, which, as already known, were oxidised by light; and here, also, he began with the simpler compounds, and then went on to the more complicated.

The investigation of carburetted hydrogen, oil of turpentine, oil of lemon, and xylen led to the following conclusions:—"1. There is least oxidation in the dark. 2. There is most in the violet. 3. It may be represented by a curve, which, starting from the dark with a value equal to 1, is equal in the red-yellow to 2, and in the violet to 3. 4. The action of the green varies with the time allowed. At first it is weak; then with time it becomes somewhat stronger, like that of the red."

The accompanying investigation of the three aldehydes—common aldehyde, oil of cinnamon, and bitter almond oil—led to similar conclusions, namely:—"1. The oxidation of the aldehyde is less in the dark than in the light. 2. It varies according to the time that the observation occupies. 3. In summer when in the dark it is equal to 1, in the yellow it is somewhat less than 2, and in the violet almost 3. 4. During the first and second days one can determine the value of previously-absorbed rays of light; a reaction is always going on."

In addition, experiments were made with ether, various oils, phenel oil, and litmus, and the results obtained generally agreed with those already given:—"The photo-chemical action upon organic bodies is usually oxidation; the intensity of this oxidation varies according to the substances, but the general rule of the action is as follows:—If the oxidation in the dark be equal to 1, that in the red will be about 2, and in the blue-violet almost 3. The oxidising action of the green is at first weak; then it increases until it becomes greater than the oxidation effected by the red, so that the oxidation of organic substances under the various rays of light may be represented by a wave which increases from the dark towards the violet, with a fall at the green."

The proportions are more complicated when a mixture of organic substances and salts are exposed to the action of light. The effect is a compound of the separate actions. Thus, when the reduction produces oxygen in the nascent state, which produces a secondary action oxidising the other compounds, the oxidation produced by the light takes place sooner than if the isolated substance had been exposed to the rays. On the other hand, a salt, at other times not sensitive to light, is reduced owing to the presence of organic compounds, which are strongly oxidised by it. From his experiments in this branch, taken as a whole, and which he has given at length, M. Chastaing comes to the following conclusions:—

"Mixtures of salts and organic substances may be prepared in which the reduction of the salts by the red side of the spectrum will not be produced, others in which it will be slowly produced, and, lastly, some in which it shall be rapidly produced. A consideration of the curves which represent the photo-chemical action produced upon each substance will explain this phenomenon.

"The action produced upon mixtures of organic substances and salts may, therefore, be epitomised as follows:—1. The red and yellow rays oxidise organic substances less than they do salts; consequently there is no reduction of the salts in this region. 2. The red and yellow rays oxidise organic substances as powerfully as salts. 3. The red and yellow rays oxidise the organic substances more strongly than the salt, in which case reduction of the salt takes place in this region. One must always keep in mind the *status nascens*, which modifies the intensity of the action, or makes it stronger, as indicated by the curves."

Not less interesting are the results of the experiments made upon the photo-chemical action upon efflorescent substances, which were as follow:—

"1. Many efflorescent substances—such as the alcoholic solution of litmus—are subject to the influence of all rays. And in this case the photo-chemical action must be classed with that produced on organic bodies.

"2. Many others—such as sulphate of quinine and turmeric—are affected exclusively by those rays which cause efflorescence.

"3. There are differences in the action produced. Sometimes it is a molecular change, as in the case of quinine; sometimes it is oxidation, as in the case of turmeric.

"4. The rays which produce efflorescence are by no means identical with those that are absorbed, and which, with some modifications, are represented by a wave; they are rather only a part of these rays, a chemical action being originated.

"5. On sulphate of quinine, amongst other substances, the action developed by these rays is considerable, for in two months during summer a third part of the quinine will be changed into quinidin."

Upon the formation of ether, which was the last subject experimented upon, the light had almost no influence; at first its action was feeble, but in time it ceased to have any action at all.—*Photographische Mittheilungen.*

HAS PHOTOGRAPHY ANY CLAIM TO BE CONSIDERED A FINE ART?

[It is necessary to state that the following paper, although read before the Glasgow Photographic Association only last week, was prepared for another purpose seven years ago. This will explain certain allusions, especially to photographic exhibitions, which but for this explanation might be considered inapplicable to the present time.]

PHOTOGRAPHY—or the "black art," as it is sometimes facetiously termed by its practitioners—hitherto the nursling of science, and sometimes called the "handmaid of art," has already reached a point in its career when the exertions of its followers require them to put forth their utmost endeavours for the future prosperity of the art, by the continued production of works that shall raise the artistic standard of photography in the estimation of critics and the public.

Photography has already achieved wonders, but the task of successfully overcoming the prejudices of the critics on art yet remains, in regard to the limited range and capabilities of photography in expressing thought and power of attempting subjects that have hitherto been considered the sole province of the artist in pigments.

That photography appears to be at present limited in its range of pictorial representation no one will deny; yet that it is capable of producing greater and more perfect results in the future we may also venture to affirm. As its practitioners acquire a more perfect mastery over the manipulative difficulties that beset them, and turn their attention more to the study of the art-capabilities of their profession, so will their works exhibit signs of improvement in expressing character, feeling, and pictorial effect.

The difficulty in admitting the art position of photography arises not so much from any defect in the actual process, or in the result which it produces, as from the fact that but few photographers have taken the trouble to learn even the most elementary laws which govern all arts alike. Hitherto the attention of photographers has been so completely engrossed in perfecting the manipulative difficulties of their profession that they have paid little attention to its art capabilities, but for a few years past they have been awakening to the necessity for artistic culture.

That photographic representation need only be photographs has until lately, it must be confessed, been the chief idea of photographers themselves. It is also evident, from the works of a few, that photography may be more than it has hitherto been considered to be. The execution of one perfect picture will do more towards elevating the taste than the continued production of any number of ordinary photographs; therefore it is necessary for all practitioners who are desirous of raising their art in the estimation of the critics to persevere in their efforts until art photography shall be acknowledged as only limited by the art capacity of its professors.

We photographers have a good ground of complaint against the art critics for the sneering and overbearing manner in which they assign limits to our powers, and in anything but an encouraging or friendly manner dictate to us what we ought or ought not to attempt.

The Department of Science and Art aids schools and institutions to give art education to mechanics and others, so that they may show more taste in their various productions; and why, then, do they rail at photographers when *they* study what has been written about art or the works of the best masters, and try to apply the knowledge or taste thus acquired to their own works? Art critics snarl at us for overstepping the limits of photography. What limits can there be? Where is the forbidden ground? The critic for *The Times*, writing on the London Photographic Exhibition of 1868, vehemently called on some one to write a book and put down the pretensions of photography. If some one would only write that book, and define the limits clearly, then we should know what to avoid; but the writer of that book would have to start with the assumption that photography has already reached the utmost limits to which it is capable of being advanced—optically, chemically, and artistically. There can be no other limit to photography or to any other art or science than what one cannot accomplish. What has been done can only be called good, bad, or indifferent.

As to the critics on the London Photographic Exhibition of last year (1869), "where they do agree in the press their unanimity is wonderful." The general wonder, after reading the whole of the opinions, will be rather at their divergence than their unanimity. Nevertheless there was one point on which they were unanimous: they appeared generally to be imbued with a wholesome dread of "tricks" and "dodges" by which they might be seduced into admiring as a wonderful natural effect anything that was the result of a manipulative dodge on the part of the photographer. The very sight of a composition picture seems to have had the same effect upon them that a red rag is proverbially said to have upon a bull. They tell the poor photographer that the function of his art is to "record facts as they are, and not as arranged for pictorial effect;" they will not allow him any of the privileges the painter enjoys. If the subject be a landscape, the painter may put in any sky his taste dictates that will compose with the lines and objects in his landscape. If the subject the painter has chosen lack a foreground he is at perfect liberty to introduce any of the carefully-studied bits he has collected in his scrap-book that will compose well with the other parts of the picture and add to the pictorial and general effect.

On the other hand, the photographer may come upon a scene he instinctively knows will make a good picture, the only drawback being the want of a good foreground; but the poor photographer must not be permitted to introduce a foreground and sky from his stock of negatives, which, by-the-bye, exactly corresponds with the painter's scrap-book. If he attempt anything of that sort by the means at his command—that is, by combination printing—his efforts are stigmatised as "tricks" and "dodges;" he is told he has overstepped the limits of photography; that the function of his art is to record facts as they are and not as arranged for pictorial effect. When criticising a composition picture, instead of giving a fair and honest opinion regarding its art qualities, knowing it may have been produced from several negatives, they bend their whole attention, magnifying glass in hand, to the discovery of flaws and joinings, and render themselves ridiculous by their mistakes. One critic discovered a joining where no joining could possibly exist; another critic was so preternaturally cute as to discover four different points of view in a group of four children introduced into a landscape by Robinson, when the fact was that the children had been taken on a single negative by one operation.

The critics should give up their prejudices, judge of the photographic picture without caring how it was produced, and call good photography an art of its own without comparison as to the means of execution; for who disputes that it is not painting or sculpture, line engraving or lithography, wood engraving or etching? We are satisfied it is an art of itself, only guided by the general laws of art for successful combination to produce an artistic result.

In the opinion of a great number our art-science is, and can be, no more than a simple copyist and faithful transcriber of what is at the time before the camera. So, in a great measure, is an artist when drawing a scene or working from a model before him. But it is the feeling and taste, combined with the power of execution, which elevate his work above those of a mere imitator; and the aim of the photographer must be directed in a similar manner by his judgment in the management of the scientific appliances of his art, and also by taste in the proper treatment of the subject upon which he is engaged, so that the result may prove that the same feeling of art can be secured by the productions of the camera as are to be attained by those of the pencil.

In affirming or denying that photography is a fine art many persons make a common mistake; they seem to think that if photography were a fine art all photographs would be works of art. I regard art as a means of making thought visible. If I can make a thought visible in a picture which people can understand and stir their emotions, it is a work of art whether I produce it by the aid of the camera or of the pencil. It is the mind of the artist and not the nature of his materials which makes his production a work of art. A man may paint and not produce works of art, or he may photograph and produce works of art. A man may be able to write legibly and not produce poetry or philosophy; therefore the art of writing is neither poetry nor philosophy. It is the thought that is expressed, and not the means by which it gains expression, which constitutes a work of art.

Some artists despise photography because they do not understand its capabilities; others because they do not think it politic to approve of it; others, again, would fain have it bottled up and monopolised for their own exclusive service, and prevent it from coming into competition with them, knowing it takes a good smart race to overtake it. Some are even shabby enough to use Photography in secret and yet openly abuse her—are afraid to be seen in company with her in broad daylight, the artistic and literary Mrs. Grundy not having yet pronounced her respectable and of good character. But there are many honourable exceptions; these are for the most part the veteran campaigners who have fought their artistic battles and gained distinction—those who do not need to care for public opinion. Among our eminent portrait painters who extensively use photography as an *aid*, and acknowledge the benefit they derive from it, I may mention the names of D. McNee, the late G. Gilbert, and Watson Gordon. Gilbert has often remarked, in the hearing of a friend of mine, that photography had put the best of them to the spur. The late Mr. Rejlander, one of our best English photographers, and a man of real taste, once asked a friend of his, an artist of some eminence, whether, if he had it in his power, he would have photography to become non-existent. "No!" was his reply; "certainly not! for what I already know of its powers, still less for what I can imagine will eventually arise out of it, I benefit by it daily; but it would not be judicious to let the public know this. Many are not ripe for it now, and many never will be."

The advent of Photography gave the death-blow to miniature painting as one of the walks of art, and threatens seriously to trench on the domains of lithography and engraving; for which offence the more conservative portion of the artistic world cannot forgive her, but do everything in their power to retard and keep her back.

The sweeping criticisims to which any photographic picture is subjected which aspires to be something more than a matter-of-fact photograph is patent to all, and has the effect, no doubt, of damping the ardour of many an ingenious and artistic photographer. It is all very well to say "spare the rod and spoil the child;" but at the same time too much rod is just as bad. ANDREW BOWMAN.

(To be concluded in our next.)

FOREIGN NOTES AND NEWS.

FOUR PHOTOGRAPHERS DECORATED.—SEMI-JUBILEE OF A PHOTOGRAPHIC ESTABLISHMENT.—THE *DEUTSCHE PHOTOGRAPHEN ZEITUNG.*—CONVEX CHROMO-PHOTOGRAPHS.—A SMALL MAP OF THE SEAT OF WAR.—REGULATIONS FOR THE TRANSPORT OF COLLODION IN GERMANY.—THE ACTIVITY OF THE CENTENNIAL PHOTOGRAPHIC COMPANY.—A TONING BATH.—"HYPO." OR NOT "HYPO.?" THAT IS THE QUESTION!—CHROMO-LICHTDRUCKS.

The Grand Duke of Oldenburg has conferred a medal for science and art upon Herr Julius von Kolkow, court photographer to His Majesty the King of the Netherlands.

In recognition of their services in connection with the Philadelphia Exhibition, the Emperor of Austria has decorated Herr Victor Angerer with the gold cross for merit with the crown; Herr Julius Gertinger with the gold cross for merit; and Dr. Hornig with the knight's cross of the order of Francis Joseph.

Fraulein Emilie Bieber, photographer to the German Imperial Court, has just celebrated the twenty-fifth "birthday" of her photographic establishment at Hamburg. When Fraulein Bieber first set up in business she had but one assistant; now she employs some thirty persons, and may be considered one of the most successful of lady photographers.

The first number of the new organ of the German Photographic Association, the *Deutsche Photographen Zeitung*, appeared on the 5th of October, but as yet no copy has come to hand, so we cannot report as to its quality.

Herr Kraus has exhibited some of his new convex chromo-photographs. These, says the *Archiv*, are not like the old-fashioned chromo-photographs, but, being pressed between two convex glasses which fit into each other exactly, they produce quite a novel effect. An advantage claimed by Herr Kraus for his process is that the pictures do not become yellow, like those rendered transparent by means of castor oil or Canada balsam, &c.

Herren Aubel and Kaiser, of Cologne, have published a miniature map in relief of the seat of the war, being a reproduction of the large map in the *Illustrirten Zeitung*, in which the smallest inscriptions are said to be quite readable.

By the regulations of the 1st June it is forbidden to send collodion cotton in the usual way per rail in Germany. Previously only guncotton was forbidden, but now, by the 48th section of the 3rd article of the new code, the transport of collodion cotton is absolutely interdicted, even though it should be in a thoroughly damp, incombustible condition, and securely packed. Collodion may, however, be sent by the tender, and the *Archiv* thinks that it may be most conveniently packed as a very concentrated solution or, rather, jelly, of the following proportions:—Ether, one part; collodion cotton, one part; alcohol, four parts; so that the jelly contains in every six parts one of collodion cotton. This grievance was ventilated at some length in the pages of the *Photographisches Correspondenz* and at the meetings of the Vienna Photographic Society about the time of the passing of the new code.

Some idea of the extent of the business carried on by the Centennial Photographic Company during the time the Philadelphia exhibition was open may be conveyed to our readers by the following abstract of the Company's transactions during one month:—

Chemicals, &c., used—

Nitrate of silver	96 lbs.
Chloride of gold	22 ounces.
Albumenised paper	17,344 sheets.
Stereoscopic printing-frames in use	1,300
Number of hands employed	41
Stereoscopic pictures produced	131,000
Other sizes, from 17 × 21 inches	18,533
Total number of pictures	149,533

In the *Archiv* E. Richter, of Munich, strongly recommends the following gold toning bath for albumenised pictures:—

(*a*)	Chloride of gold	1 gramme.
	Water	1 litre.
(*b*)	Sodic acetate	15 grammes.
	Water	500 ,,

Pour the solution (*a*) into the solution (*b*); then add four drops of a saturated solution of cupric sulphate and let the whole stand for a few days. Tone the pictures only until the half-tones in the face appear somewhat bluish. Though this may still seem somewhat too red it will be found, after fixing, that the pictures are beautifully toned, and that the whites are very clear. The fixing bath should not be too strong, but somewhere about one to ten.

In chemistry, as in every other progressive science, old things must give way to new; and, as new facts come to the front, it is often found that the old names for even the old facts are inappropriate. A striking instance of this is given by hyposulphite of soda ($Na_2 S_2 O_3$). This is a salt of many names—we had almost said "of many tails." In German scientific works it figures as "unterschwefligsaures natron," as "natrium hyposulfit," as "natrium dithionit," or as "dithionigsaures natron;" in the *Pharmacopœia* as "natrium subsulfurosum;" in the manufacture of paper as "antichloride" and "natrium bisulphit;" and in photography as "soda," or at most as "fixing soda." Then there is the French abbreviation, "hyposulphite," and the more familiar English term, "hypo." All of these names, we are told by Herr Rud von Wagner, in a communication to the *Industrie Blätter*, have become inappropriate since the discovery, by Schützenberger, of the salt $H_2 S O_2$ which renders the name of hyposulphuric acid impossible for the compound $H_2 S_2 O_3$, and which he thinks should rather be called "thiosulfurous acid." The old hyposulphite of soda is to be called in future "natrium thiosulfat" or "thioschwefelsaures natron" by the Germans, and Wagner recommends that in commerce it should be called "*thiosulfat*" or "*thiosulphate*," and that the term "hyposulphite" should be reserved for the newer salt. As the Germans have such a choice of terms it will be comparatively easy for them to adopt the desired distinction; but it seems almost an impossibility for us to disassociate the name of "hypo" from $Na_2 S_2 O_3$, so it is to be feared we shall disoblige Herr Wagner in this matter.

The weekly *Kunst und Gewerbe* has a very favourable notice of some lichtdrucks printed in natural colours by Herr Albert's new process, and exhibited at the recent exhibition in the Bavarian Industrial Museum at Nürnberg. No practical details of the process are given, as these have not yet been made public in any form by the inventor.

Meetings of Societies.

GLASGOW PHOTOGRAPHIC ASSOCIATION.

A MEETING of this Association was held in their Rooms, on Wednesday, the 24th ult.,—Mr. Andrew Mactear occupying the chair.

The minutes of the previous meeting having been read and adopted, five gentlemen who had previously been proposed and seconded as members were admitted.

After some preliminary business Mr. Andrew Bowman was called upon to read his paper on *Has Photography any Claim to be Considered a Fine Art?* [See page 523.] The paper was well received, the members being entirely at one with Mr. Bowman in the sentiments therein expressed.

Mr. J. URIE thanked Mr. Bowman for the great pleasure he had had in listening to his paper. The fact that many artists looked down upon their profession, seeing no art therein, was quite apparent to all, and he had personal experience of it himself when the art critics, speaking of photographs he exhibited at the first Photographic Exhibition, ran them down mercilessly, though Noel Paton afterwards asked for copies of many of them, using them in some of his now famous paintings. It was, he believed, a fact that Graham Gilbert used photography extensively, though he did not want the public to know he did so. He quite agreed with everything Mr. Bowman had said.

The CHAIRMAN, speaking of artists and photography, also said that some artists used it to a large extent. Frith, in his great picture of the *Railway Station*, had used it to get groupings, filling in the details afterwards from sitters and models. He thought the length of exposure often required was a detraction, and if photographs could be taken quicker more soul would be exhibited in them. He also thought that no one could reasonably have any objection to composition pictures, there being nothing outside the bounds of art, in his eyes, in manipulating the sky or foreground to gain effect. Poets and artists were allowed a licence, and, if allowed to them, why not also to the photographer? He remembered seeing a picture of *Dunottar Hill and Firth of Clyde*, by a famous artist, the foreground of which was especially rich, and one of the finest bits of painting he had seen; but it was mythical, being introduced to give effect, and was nowhere to be found on the landscape depicted on the canvas. Horatio McCulloch, as many artists doubtless still do, was in the habit of carrying a small sketchbook continually with him, jotting down, as he came across them, any little mounds of stones, rocks, or groups of ferns, &c., that attracted his attention, keeping them for further use and reference. If such liberties be allowed to artists, he did not see why they were not to be permitted also to photographers.

Mr. URIE thought it would be a good idea if landscape photographers made it a part of their business to collect such little bits as would have attracted the attention of Horatio McCulloch, and publish them for the use of artists.

Mr. MCPHERSON pointed out that many portrait artists used photography as an aid, the portrait to be painted being, by the magic lantern or other similar means, reflected on the canvas and then drawn in.

Mr. URIE believed Mr. Norman Macbeth used photography in this way.

Mr. MACTEAR said he remembered, when in Vienna, seeing a mode of enlarging on canvas, the company who practised it doing an extremely large business. The operation was carried on in a dark room, artificial light being used. The light was made to fall upon the picture or photograph to be enlarged, reflectors being also used to cast all the light possible on the picture. A reflection of the image was caused to pass through a lens, then cast on to a large movable frame about eight feet high that ran upon rails and could be moved backwards and forwards so as to suit any size required. This frame was exactly perpendicular to the lens, and, a sheet of paper being affixed to the glass sheet composing the frame, the image was received thereon, and the artist sitting at the back had but to draw it on the canvas as fixed upon the opposite side. Also in Herr Albert's studio, in Munich, a large business was done in copying the finest paintings found in the exhibitions on the continent. Skilled artists were employed in going through these exhibitions and copying the paintings in black and white, from which negatives of all sizes were taken and prints printed therefrom. Such photographs were extensively sold and bought on the continent, where they were much used for home decorative purposes—much more so, he thought, than in this country. The contrast between the brilliant colour of the painting and the dull black and white of the copies looked, at first sight, strange; but to get perfect photographs no other method suited so well.

Mr. **Henderson**, of Perth, who was present, said he had nothing more to say regarding art or artists than what had already been expressed. Being in Glasgow he had come to the meeting, and was extremely glad he had done so; for, though he would have had the pleasure of reading Mr. Bowman's paper in The British Journal of Photography, his pleasure had been heightened in hearing Mr. Bowman read it himself. It was an extremely thoughtful and able paper, and he wondered Mr. Bowman had allowed it to lie beside him for such a length of time. He was impressed at the manner in which the business of the Association was conducted—the Chairman looking like a father with a family around him, so familiar were they all. The Secretary, too, was indefatigable in catering for the interests of the members, ferreting out matters likely to interest them, and clinging to every person likely to do them good, until he had a promise of something to occupy the time during a meeting of the Association. All these benefits the rising young photographer could not value too much; and he trusted they would pay great attention to all that was said and done, and, putting their inestimable advantages to use, make every effort to raise the status of their fascinating profession.

A conversation ensued on the commercial uses photography were now being put to in illustration of books, prices current, and advertisements of all kinds, its aid in this branch becoming every year more and more sought after.

Mr. R. **Dodd**, in speaking of the commercial uses of photography, mentioned the instance of the *Architect*—a journal published weekly, a photolithograph of some architectural subject being given away with it every issue. Commenting on Mr. Bowman's paper, he thought critics seemed still to be of the same mind regarding photography as an art as they had been when Mr. Bowman first wrote the paper. It was their hard and false criticism which had put down composition photography to a great extent, its influence being felt even yet, he thought. Though photography might not be a "high art," in his opinion it could quite reasonably be classed amongst the "fine arts." The greatest difficulty to its being a high art was the impossibility of producing a mental ideal. Guido was one day asked why he kept so sacredly hid from view the beautiful model for the many charming Madonnas he produced. He replied that he had none such, and, bringing forward an old, drunken, debauched rascal of a colour grinder he had in his employ, he posed him in the centre of his studio, adjusted the light, saying "there's my model." A rude and very general effect was all he required, the beautiful features and graceful lines being but the production and fancy of his mind.

Mr. **Sloan** then drew attention to some of the new modes of quickening exposure that were being spoken of at the present time, and moved a resolution to the effect that the Society should inquire into their merits.

The motion was seconded.

Mr. **Gilfillan** averred that he saw some beautiful negatives produced by Newton's emulsion, when by the ordinary wet-plate process an image could not possibly be got, so bad was the light.

The following committee was formed to test the qualities of Newton's emulsion and report:—Messrs. Dodd, Urie, Gilfillan, Mactear, and Bowman.

Mr. **Dodd** expressed himself as somewhat incredulous as to new methods of quickening exposure, and felt that experimentalists should be extremely cautious—the mixing of new and fresh chemicals, and even the cleaning of windows, often very materially producing the quickness instead of any inherent qualities in the alleged improvements.

Votes of thanks to Mr. Bowman, for his very able and interesting paper, and to the Chairman brought the meeting to a close.

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LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The usual monthly meeting of this Association was held on Thursday, the 25th ult., at the Free Library, William Brown-street,—the Rev. H. J. Palmer, President, in the chair.

The minutes of the previous meetings were read and passed. Mr. J. T. Danson and Mr. S. Spoonley, Jun., were elected members of the Association.

The President and officers were appointed a sub-committee to attend the meeting of the proposed Associated Science and Art *Soirée* Committee.

The council having selected for the presentation print an enlargement of the *Arch of Constantine*, from a negative taken by Mr. O. R. Green, it was resolved unanimously that the same should be accepted, and a hearty vote of thanks was passed to Mr. Green for his kindness in allowing the use of his enlarged negative. It was announced that the pictures could not be printed and ready for distribution until next spring, but a specimen print, in carbon, was exhibited in the room, and elicited universal satisfaction.

A large number of microphotographs, lent by the Microscopical Society of Liverpool, were exhibited. They had been taken by J. J. Woodward, M.D., U.S.A., and were exceedingly interesting, not only as beautiful specimens of microphotographic work, but also as showing the necessity of the application of photography to micrometry with reference to the micrometry of blood in criminal cases.

A cordial vote of thanks was passed to the Microscopical Society for giving the members an opportunity of examining such a valuable collection.

The Rev. J. D. Riley showed a number of excellent prints by a washed pellicle process, and the President exhibited some enlargements by the sciopticon, and some prints taken with the scenograph.

Mr. W. H. **Wilson** said that since the previous meeting he had been taking some views in Normandy, and found the actinometer invaluable as an aid in judging of the time for exposing dry plates. There he got a tint in the shade in a minute and a-half; but here today it took two hours in the sun to get the same tint.

Some discussion followed as to the most portable form of actinometer, and it was suggested that at the next meeting the members should bring forward any form of actinometer they thought most suitable.

The meeting was shortly afterwards adjourned until the 29th inst., which would be the annual meeting.

◆

Correspondence.

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SUBSTITUTES FOR GLASS.

To the Editors.

Gentlemen,—In the last issue of your valuable Journal, in the article *On Substitutes for Glass in Landscape Photography*, when speaking on my system, you say:—"On the other hand, there is the slight objection of having to expose through a sheet of glass in order to ensure a perfectly plane surface," &c. This, however, is not the case with my sensitive tissue. Whether it be used in the shape of blocks or in the roller slide no glass is needed to secure the plane surface.

I consider it a rather grave objection to have a glass in front of the sensitive surface—not so much on account of alteration in the camera, but on account of reflections from the surfaces and refractions in the body of the glass disfiguring the image formed by the lens before it reaches the sensitive surface, at the same time diminishing the actinic power of light impoverished by reflections and refractions.

Blurring, quite unknown on my tissue, appears in aggravated form when glass is used in front of it.—I am, yours, &c.,

October 31, 1877. L. Warnerke.

◆

SPOTS ON EMULSION PLATES.

To the Editors.

Gentlemen,—Referring to my paper, read before the South London Photographic Society, on the above subject, it must be borne in mind that it was given as the result of my experience and how I succeeded in getting rid of the trouble; and I may state now, as I did then, that I am quite free from any kind of spot, either transparent or opaque. Should I find them occur again I will make a further communication on the matter, and I hope the subject will not be dropped in your pages until a perfect mastery is gained. This is only to be gained by the many workers of the emulsion process giving their experiences and opinions on the matter with a right good will.

I see in this week's issue a communication from Mr. J. Dudley Radcliffe upon the subject. I for a long time held the same opinion, which seemed to me then very feasible, but I do not hold that opinion now (I mean as regards small particles of nitrate of silver being in suspension). The test he suggests I do not think will meet the case, as one can never tell whether the plate from a batch contains any spots at all; for it is a well-known fact that one plate may contain many, and the next plate from the same lot will be quite free. I never found that the spots occurred more in the sky than on any other part of the plate. I will give an instance of a plate that was shown me by Messrs. Wratten and Wainwright, some six months since, which was very remarkable. It was covered with spots, both transparent and opaque; the transparent spots were in the parts that had been exposed to light, and the opaque spots were in the shadows only and the thin half-tones. I have never had anything of this kind occur in my practice.

With respect to filtering emulsions: filtering through a very fine material I do not like, for, to my mind, it only takes the sensitive material out of the collodion. All I do is to only strain it through a piece of tow in the neck of a funnel; and sometimes I do not filter or strain it at all, yet get the most perfect results.

Our friend, Mr. Radcliffe, must not think that I am writing this for the sake of opposing him; it is only the difference of opinion, and a correct statement of my system of working, which is now quite to my satisfaction. It is a well-known fact that by a certain system many may get the most perfect results, while others will get nothing but failures; and, although the results are so widely different half the time, if matters were looked into by the other party they could point out where the cause of failure was, and I think that by giving this subject the closest scrutiny, and bringing or giving a statement of results before other workers, is the only way to get rid of annoyance in connection with the foregoing subject.—I am, yours, &c., WM. BROOKS.

Reigate, October 27, 1877.

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THE MEDALS AT THE PHOTOGRAPHIC EXHIBITION.

To the EDITORS.

GENTLEMEN,—In reference to the award of medals at the Photographic Exhibition will you permit me to say that some little time must elapse before the jurors can consider all the claims of candidates for the long series of medals announced for competition. Another reason for delay is the circumstance of Mr. Cooke's absence in Italy—a juror whose presence could ill be spared. Mr. Cooke's arrival in England is daily expected, and he will probably be in this country before these lines are printed.—I am, yours, &c., H. BADEN PRITCHARD, *Hon. Sec.*

Royal Arsenal, Woolwich, October 30, 1877.

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SPOTS.

To the EDITORS.

GENTLEMEN,—The silence of Mr. Brooks and the virtuous indignation of Mr. Baynham Jones are alike impressive. For my "excessive bad taste" the latter treats me to a castigation; the former with solemn, dignified silence. "Speech is silver, silence is golden." I have, personally, the highest respect for both these gentlemen. I laugh not at men, but at notions gravely put forward in a paper read before a public society, and which being circulated among the public are fit subjects for public discussion. I mind not who may be the author of them. If he will not, or cannot, defend them so much the worse for the notions. As Mr. Baynham Jones apparently despises argument by analogy, let me adopt a different style, the force of which, perhaps, he will recognise; for, if he really believe the notion I now attack to be correct, I may do him some service by at least suggesting its falsity, leaving the result to his own good sense.

Now for spot No. 2. Description: "patches of insensitiveness." Cause: "absorption of moisture by the chloride contained in the emulsion." Take twenty ounces of emulsion prepared with excess of silver nitrate by any of the published formulæ, corrected with hydrochloric acid. The quantity of chloride it will contain may vary from one to twenty grains or more, "according to taste and fancy." Say twenty grains. A pint of emulsion in the hands of an experienced operator ought to be ample to coat (not to exaggerate) fifty plates 10 × 8. Each 10 × 8 plate having eighty square inches of surface, it follows that fifty plates, if spread out, would cover an area of 4000 square inches. Divide this total by twenty (the number of grains of chloride in the twenty ounces), and we have a quotient of 200. Each grain of chloride is, therefore, evenly distributed or diffused over an area of 200 square inches, or, in other words, each inch contains $\frac{1}{200}$ grain. If the human imagination can grasp this microscopic trifle, can it also account for the fact that this one grain of chloride of silver diffused equally throughout an area of 200 square inches, in virtue of this "presumed" affinity for moisture, only absorbs moisture in patches —that is, in parts—when the whole of the area is subject to like influence?

Surely I may reasonably argue that the author of this notion does not compound his own emulsion, otherwise, acting in the spirit of his conviction, backed by the "light of investigation," he would abandon the chloride (there being other correctives), and thereby avoid the patches. If he do compound his own emulsion, and for any reason uses the chloride as a corrective in preference to others, why has he not done the chloride justice by acknowledging this overwhelming quality of excellence which compels him to employ it, in spite of patches? On the other hand, if he employ the emulsion of other makers, how does he know it contains a chloride? Let us have the whole truth.

The Editors appeal to me for information touching spots. Verily there are spots *and* spots. Some may be due to careless manipulation; more to ceaseless changing of the constituents of the emulsion; others to improper storage of sensitive plates in boxes made of unsuitable material not varnished inside; others to atmospheric influences. Once spots and I were intimate acquaintances; they visited nearly every scene I photographed. Now they no more frequently trouble me with their unwelcome presence than do spots in wet-plate work. To what shall I ascribe this immunity? To greater care, increased experience, or special providence? Those who know most of spots speak as to their causes with the greatest diffidence.

I will, with your kind permission, take the negative side in this controversy. A little criticism administered more or less palatably may be of some service in pruning the luxuriant growth of positive assertion, which, like a tropical plant, flourishes among that numerous band of ardent experimentalists who draw their inspiration and encouragement from the pages of our excellent BRITISH JOURNAL OF PHOTOGRAPHY.—I am, yours, &c., GEORGE T. MOORE.

Hammersmith, October 29, 1877.

Miscellanea.

PHOTOGRAPHY IN PRISON.—Among the appointments sanctioned at a recent meeting of the Town Council of Liverpool was that of Messrs. Brown, Barnes, and Bell, to photograph prisoners at the borough gaol during the year ending October 31, 1878.

PHOTOGRAPHING PRISONERS.—On Saturday morning last a ludicrous scene was witnessed in the Preston Police Station. As is known, all persons charged with felony, &c., are compelled to have their photographs taken, so that the police authorities may "mark" them and identify them in other places if ever they should offend again. Following out this practice, a female convicted of felony was on Saturday ordered to stand in the Preston Police Station whilst her likeness was taken. But to this she evinced a decided repugnance, and threatened to knock the photographer and his appliances down if he attempted to take her portrait. The police insisted, and she as pertinaciously repelled their efforts, and threw herself upon her back on the floor. On being raised up she drew her hair over her face, and swore they should not have her photograph. Seeing that persuasion was of no avail, the constables had to use violence, and whilst one clutched her firmly about the body another drew her hair back and held it tightly behind her head. Though thus secured, she employed another means to defeat their purpose, and this was by making the most ludicrous grimaces and putting out her tongue. She would, she said, rather serve ten years' penal servitude than that they should take her photograph. The photographer, after repeated attempts, which occupied little short of an hour, succeeded in at last securing something like a normal likeness; and the woman, who continued to use frightful imprecations, was conducted to the police cell.

PHOTOGRAPHY IN COURT.—At the Bloomsbury County Court, on Monday last, the 29th ult., the case of Everett *v* Mears was heard before Mr. Judge Russell. It was an action in *detinue*, in which the plaintiff, a gentleman residing at Maitland Park, Haverstock Hill, sued the defendant, a photographer of Camden Town, to recover an oil painting left with the latter from which *cartes de visite* were to be taken; or in lieu of the picture £25 was claimed as unliquidated damages.—Mr. Marcus Lewis, who appeared for the plaintiff, said that his client, anxious to send some photographs of his late mother to friends in Australia, entrusted her portrait to the defendant to be photographed from. In the course of time the pictures were sent home, but were so badly executed that they were sent back to the defendant by the plaintiff, who demanded the return of the picture in order that he might have the photographs from it taken elsewhere. The defendant, however, persistently refused to give up the portrait unless the sum of 13s. for the two dozen *cartes* ordered by his client was paid. He (Mr. Lewis), in his professional capacity, had written to the defendant, who took no notice of the communication, hence the present action was brought.—The plaintiff stated that his ground of objection to the *cartes* was that they were very yellow, and had so very common an appearance that he could not send them to his friends.—On behalf of the plaintiff Mr. Pedroletto, a local photographer, said that the proofs had not been sufficiently washed. That had caused the yellow tint complained of. He added that, generally, the photographs were improperly executed, and could never have stood the test of a sea voyage.—The defendant said the picture in question from which he took the photographs was so highly varnished, and the lights in it so very indistinct, it was impossible to take a better copy than the one he had done.—In answer to his Honour the defendant said he did not mention this to the plaintiff; upon which the Judge, looking at the photographs, said that he considered they were very coarsely executed, and the plaintiff was not entitled to have them forced upon him. His judgment would therefore be that the defendant should at once give the plaintiff the picture, and fined the defendant one shilling as nominal damages.—The plaintiff's solicitor said in that case he should not apply for costs. Judgment was entered accordingly.

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EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale*, that being done at a small cost in our advertising pages. This portion of our columns is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

Wanted to exchange, a quarter-plate camera and lens with glass bath for anything useful. Send offers to R. YOUNGS, 3, Stoke-hills, Ipswich, Suffolk.

Wanted, camera for enlarging purposes, 8 × 10 or larger; in exchange for pictures or portrait frames.—Address, J. WILSON, 5, Keith-terrace, High-road, Lee, S.E.

A perfectly new *carte* lens, with diaphragm in case, offered for copying and enlarging camera up to 8½ × 6½, with bellows body.—Address, W. H. BELCHAMBER, Chart-road, Reigate.

A whole-plate lens, walnut camera, baths, negative boxes, camera-stand (mahogany), head-rest, and other apparatus, offered in exchange for a diamond ring.—Address, E. ARROWSMITH, 331, Edgware-road, London, W.

ANSWERS TO CORRESPONDENTS.

Photographs Registered—

James Cooper, Darlington.—*Twelve Views of the River Tees, Hurworth Village and Church, Middleton, and St. Lawrence Church.*

Thomas Bourke, Perth.—*Two Portraits of the Rev. Mr. Holder.*

Notice.—Each correspondent is required to enclose his name and address although not necessarily for publication. Communications may, when thought desirable, appear under a *nom de plume* as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

☞ *Correspondents should never write on both sides of the paper.*

Rustic.—Thanks for the price list.

An Inquirer.—We are unacquainted with the electric light named.

J. and J. Dutton.—Your letter shall be placed in the hands of a gentleman who will be able soon to supply the desired information.

Pyloe.—The generator appears to do everything that has been claimed for it. We have seen it tried on more than one occasion, and were pleased with its working.

Rev. Thomas Smith.—We are unable, from a practical trial, to offer any opinion respecting the lens, but have heard varying reports concerning its capabilities.

Flexible.—The process you suggest will answer the purpose if the various manipulations be skilfully conducted. You can try it without giving yourself much trouble.

C. S. A.—The best proportions are one part each of alcohol and caustic potash and ten parts of water. Pour this on and off until the varnish is dissolved off; then wash the negative and intensify with silver and *acid* pyro.

B. J.—Fix the prints in a stronger solution of hyposulphite of soda than you have been using, and give them a more thorough washing. It will be better for you not to make the proposed addition of iodide of iron to the collodion.

J. H. S.—It is probable that a flame of the desired kind will be produced by dissolving a suitable chloride in the alcohol with which your lamp is to be fed. But a much better light will be obtained by making use of a candle or lamp the flame of which is shielded by a chimney of an orange or ruby colour.

Richard Crowe.—Thanks for the two numbers, which will be appreciated. We have long been aware of the origin of the process for converting negatives into positives by means of nitric acid, and have invariably given due credit for the discovery to Major Russell, to whom rightfully belongs the honour.

J. E. G.—We reply to what we believe to be your difficulty:—After the *licht-druck* plate has been taken from the printing-frame in which it has been exposed to light under the negative it is sponged with, or placed in, water, so as to remove the unaltered bichromate. After this has been done it will no more be affected by light.

B. (New Orleans).—1. The paper has reached us in quite a discoloured state. It is, therefore, evident that it will not keep good for four weeks. We advise you to try the effect of floating a sheet of albumenised sensitive paper on a bath of citric acid of the strength of five or six grains to the ounce, allowing the albumenised side to be uppermost.—2. The best method of improving the landscape negatives is to apply a very hard ground-glass or matt varnish to the back, and then to work upon that with a blacklead pencil. Some have recommended the grinding of the back of the negative with emery powder; but this is a dangerous proceeding unless in very skilful hands.

Auld Scot.—Our correspondent has been making a trial for the first time of a lens cap of the kind we recently described in connection with giving auxiliary exposures to negatives which have received only half the proper exposure in the camera, and he finds that he is by this means enabled to reduce his exposures to a great extent. He has constructed the cap himself, and it is so formed as to be capable of having inserted in it slips of paper and glass of various colours, so as to determine by experiment that which is best. He finds a piece of glass, ground on one side and varnished with blue, green, or purple on the other side, answer well. Anyone, he says, can try this experiment at a cost of sixpence.

X. Y. Z.—The negative bath of this correspondent has become disorganised. He describes its condition as follows:—"It is a 10 × 8 bath containing about thirty ounces. About a fortnight ago it was perfectly right. I took it with me on a journey, and did not notice anything the matter till I was putting it in the bottle just before returning home, when I noticed it was slightly yellow. After I got home I did not see it for a day or two, when I could see that it was more coloured. I placed it in the light for five days, when it got worse, till it is now as dark as sherry but quite clear. I tried some plates; they have the appearance as if they had not been cleaned, and are fogged. The fog seems to be on the surface only, the picture showing through it. If you could inform me what to do with it to rectify it I should feel obliged."—— In reply: the bath exhibits all the symptoms of having received an accession of some organic matter, such as albumen. The remedy consists either in adding sufficient ammonia to render it slightly alkaline and placing it in the sun for a day or two, or in adding a little carbonate of soda and heating it to the boiling point. The addition of a few drops of a solution of permanganate of potash will also prove a remedy; even a slight dose of cyanide of potassium, followed by heat, will probably make it all right. In short, there are numerous remedies for such a state of the bath, and they are all nearly equally efficacious.

A. G. M.—Dissolve Prussian blue in a saturated solution of oxalate of ammonia, and with this solution wash the paper. The image obtained by exposure under a negative will be very feeble, but it becomes intense upon immersing the print in water, and then applying a wash of diluted hydrochloric acid. This image possesses the curious property of fading in the light, and becoming restored by being placed in the dark.

G. P.—An iron-developed transparency usually possesses an excellent tone when viewed *as* a transparency; but a decided objection prevails against the light colour of the deposit when looked *at*, not *through*. To improve their appearance when looked at by reflected light, immerse in a weak solution of chloride of gold, and carefully avoid the temptation of using a salt of mercury for this purpose. Either of the lenses mentioned will answer for producing the transparencies; but you will find those of the longest focus the most manageable.

Canon Beechey.—Received. In our next.

☞ **Editorial Communications should be addressed to "THE EDITORS"—Advertisements and Business Letters to "THE PUBLISHER"—at the Offices, 2, York Street, Covent Garden, London, W.C.**

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Cloud Negatives.—We have received from Mr. W. Perry, Hythe, Kent, four examples of the cloud negatives which are now being prepared and issued by him. They produce charming effects, and must prove of inestimable value to the landscape artist.

Obituary.—We regret to learn that Mr. Joseph Durham, A.R.A., sculptor, died on the 27th ult., at his residence in London. Mr. Durham was for some time a member of the council of the then London Photographic Society, but he does not appear to have taken any active interest in the practice of photography.

West Riding of Yorkshire Photographic Society.—The next ordinary meeting of this Society will be held on Monday next, the 5th inst., at the Odd-Fellows' Hall, Thornton-road (opposite the Corporation Baths), Bradford, at 7-30 p.m., when, in addition to other important business, the annual election of officers will take place.

York's Lantern Readings.—Mr. F. York has just issued a most comprehensive set of *Readings* for the magic lantern. Each of these is devoted to one special subject, and the subjects thus treated are much varied in their nature, comprising India, Rome, the Highlands and Lowlands of Scotland, Egypt, Central Africa, the Arctic Regions, Turkey, and others. *Readings* are also to be found in connection with the "Pilgrim's Progress," and with slides illustrative of scenes and incidents mentioned in the Old Testament Scriptures. They have been all written by competent authors, and we may state that the one last mentioned has been prepared by our friend the Rev. T. F. Hardwich, who, in a prefatory note, says that, while all who are accustomed to instruct the young in the Holy Scriptures will acknowledge the aid to be derived from pictures and illustrations, few, comparatively, are aware of the advantages which the lantern offers in this particular. Our own opinion of the great value of such *Readings* as an accompaniment to the projection of lantern pictures upon the screen is too well known for us to repeat here. Every lantern exhibitor will feel indebted to Mr. York for issuing such an attractive series.

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METEOROLOGICAL REPORT.

Observations taken at 406, Strand, by J. H. Steward, Optician

For the Weeks ending October 31, 1877.

These Observations are Taken at 8.30 A.M.

Oct.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks
18	30.39	W	34	35	52	32	Foggy
19	30·34	W	38	40	56	33	Foggy
20	30·15	W	45	49	63	38	Hazy
22	29·79	SW	55	57	63	53	Foggy
23	29·62	SE	47	49	57	45	Foggy
24	29·54	SW	41	44	56	40	Fine
25	29·30	S	51	52	54	42	Raining
26	29·77	NW	48	50	56	47	Cloudy
27	29·91	SW	52	54	57	48	Cloudy
29	29·87	SW	53	55	60	48	Raining
30	29·89	W	50	51	61	48	Cloudy
31	30·14	W	48	51	—	49	Fine

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 914. Vol. XXIV.—NOVEMBER 9, 1877.

PHOTOGRAPHERS OUT OF THE STUDIO.

Although the pages of this and other journals devoted to the cultivation of photography teem with the doings of photographers *in* the studio, yet, as men of the world, they have to take their part in the everyday duties of life. It is pleasant, therefore, to observe that the same tact and perseverance that enable them to succeed in their special walk also qualify them to shine as citizens, when they devote themselves to the task. It is true that they have not received the courtly honours in this country that they have abroad, and it is a question whether that is desirable; still, it is quite a different thing when they are selected by their fellow-citizens to hold high offices, for it is only by special fitness that they thus earn their positions.

We have more than one example before us just now of men whom the world delights to honour who are intimately associated with our art. It was only the other day that we announced the elevation of Mr. John Stuart, of Buchanan-street, Glasgow, to the provostship of Helensburgh; and several years ago, when recording the sad fate of Mr. John Mawson, we stated that he met with his death when fulfilling the duties of Sheriff of Newcastle-on-Tyne. The London Stereoscopic Company has long been known as a flourishing commercial firm, the windows of whose establishments form perpetual photographic exhibitions in two of the most important streets in the world. The active spirit who has ever guided this company is Mr. G. S. Nottage. His fellow-citizens of London first elected him to the council chamber, and next raised him to the aldermanic bench (where he sits as a magistrate to administer justice). More recently he has been elevated to the dignity of sheriff of London and Westminster. In due time he will arrive at the highest honour that is not in the gift of the crown—that of being the Lord Mayor of London.

In another direction we observe the name of a well-known photographic veteran—Mr. J. E. Mayall—who, after achieving the highest honours in his professional career in London, aspired to conquer new worlds. Of recent years he has taken up his residence at that gayest of English towns, Brighton, or, as Thackeray described it, London-by-the-Sea. In addition to establishing there a handsome photographic establishment he has for years past taken an active part in promoting many other important commercial undertakings. He has especially devoted himself to the encouragement of education, particularly of the higher grade. His fellow-citizens have conferred municipal honours on him, have speedily raised him to aldermanic rank, and to complete all he is now mayor of Brighton. On this day his inaugural banquet takes place, and surrounding him at the festal board will probably be many of his old photographic friends who, in years gone by, have struggled with him in fields quite different from those in which he gathers his present laurels. In instances such as these we cannot avoid thinking that a reflected glory is thrown on the pursuit of professional photography.

We have yet another instance, in quite a different direction, of showing how photographers *out* of the studio achieve honour and do good in their day and generation. The inhabitants of the pretty town of Ryde, in the Isle of Wight, have recently established a new literary society, and in seeking for a worthy individual to become their president they have selected our well-known friend, Mr. Jabez Hughes. Had it been a local photographic society we should have felt no surprise in the selection. We have long been aware of this gentleman's intimate acquaintance with science, literature, and general knowledge apart from photography, and we are pleased that his fellow-citizens have placed him in a position in connection with which they may benefit by his influence in an extended direction. That he is the right man in the right place is undoubtedly shown by the eloquent inaugural address (now before us) which he has recently delivered. The subject is not of that technical nature that will bear introducing to our readers, but there is one passage where, if the word "photography" is substituted for that of "science," will exactly illustrate how our art-science has grown to its present dimensions:—

> "The growth of science illustrates the accumulation of truth. One man discovers half a truth here and another half a truth there, and when brought together they coalesce and form one whole truth. Truths often appear isolated; but as fresh ones arrive they blend together and mutually explain each other. France contributes its quota today, England tomorrow, America the next day, and so it goes on; for science belongs to no country, but exists for all men. The constant business of scientific men is as much the removal of error as the addition of truth. Every fresh fact and new statement is passed through the fiery ordeal of critical examination before it is added to the growing pyramid of knowledge. Deprive it of free discussion—put barriers on its unlimited investigation—and you strike at the root of its existence. What is true of science is true of all other subjects, for science is only another name for systematised truth."

We are aware that the foregoing are not isolated cases of photographers achieving honourable distinction when they leave their cameras and dark rooms, and we shall be pleased to note from time to time fresh examples as they arise—both for the stimulus they afford to others to go and do likewise, as well as to show that the same skill and business qualifications which enable men to succeed in connection with photographic establishments are exactly those which fit them to excel in all other departments of life.

ON THE TREATMENT OF EMULSIONS WITH ALKALI.

We have recently had occasion to refer to the benefit derived, under certain circumstances, from the treatment of the emulsion while in the state of pellicle with certain alkaline solutions, and it has appeared to us from time to time that if the emulsion could be submitted to a similar action during the stage of sensitising a still greater advantage would be likely to accrue. But, unfortunately, in this latter application of the alkali we encounter a difficulty which in the ordinary manner of manipulation destroys all chance of success, namely, the decomposition of the pyroxyline by the alkali employed, which ends in the thorough disintegration of the emulsion and resulting films.

This action of the alkali commences with a general thickening of the collodion, varying in degree, of course, with the quantity of alkali employed. If a tolerably strong dose be given, the collodion in the course of a few minutes will assume the consistence of a stiff jelly, scarcely fluid enough to be affected by the most vigorous shaking. Gradually, however, a thin, watery fluid commences to separate, and, in the course of a few minutes, under the influence of agitation it is transformed into a mass of gelatinous particles surrounded by thin fluid, but not forming a mixture therewith. After the lapse of a few hours, however, it forms a homogeneous mixture extremely thin and limpid, and which, poured upon glass, gives a rough, powdery film which dries perfectly white and opaque, and presents none of the usual appearances or properties of a collodion film. Such in an exaggerated form is the change which may be expected to take place in the physical properties of an emulsion treated with alkali; and, if we desire to avail ourselves of any beneficial action the latter may exert in the formation of the sensitive material, we must first seek for some means of counteracting the rotting of the pyroxyline.

In the course of our experiments made some months ago with the ammonio-nitrate of silver salt supplied to us by Mr. Johnston, we were struck with the peculiar richness of colour exhibited by the emulsions it formed, but were met by the difficulty in obtaining an even and structureless film when dried. Mr. Johnston himself, we believe, overcomes this difficulty by the addition to the emulsion of albumen, which is readily taken up by the free ammonia; but this, we fancy, is but a temporary respite, for a sample of emulsion prepared by Mr. Johnston himself, which was in perfect condition when it reached us, commenced in a very short time to exhibit signs of "rotting." The films, though beautiful in texture and colour before washing and drying, were so weak that they floated off the glass in innumerable fragments when immersed in water, and if dried without washing assumed a dead, opaque appearance, and were found to be covered with a fine network of reticulation.

This emulsion, which was set aside as useless, afterwards suggested to us the course of experiment we have been recently engaged in. We found that if allowed to rest for a few hours the whole of the silver bromide was deposited—not in the partial manner usual with emulsions of most descriptions, but so thoroughly as to leave the supernatant collodion perfectly bright and transparent, and of the colour of brown sherry. When shaken up and re-emulsified it showed not the faintest trace of apparent granularity until dried on the glass. It was evident, then, that while the sensitive material was in a perfectly satisfactory condition, it was rendered useless by the rotten state of the collodion holding it in suspension; obviously, if we could replace the latter with a new sample the resulting emulsion should be perfect, *provided* no essential element to its successful working be removed with the collodion. The experiment was easily tried; the bromide was allowed to settle thoroughly, and the clear liquid portion of the emulsion decanted as closely as possible, and replaced by an equal quantity of plain collodion containing five grains of pyroxyline to the ounce. Upon shaking, the deposited bromide re-emulsified perfectly, at once forming a rich, dense emulsion. The film upon glass dried entirely without structure; and, as regards working properties, not only were the results equal to the best washed emulsion, but in some respects better.

Now, if an ordinary emulsion were to be treated in the same manner, the re-emulsification would not be so perfect—at least we have never found it so—possibly because the deposition of the bromide not being so complete the finest particles, which form the best part of the film, are lost. We have never met with an ordinary unwashed emulsion which, after depositing its bromide so completely as to leave the liquid portion clear and transparent, was capable of giving a film free from granularity, even though it might have done so previously. It will be found, we think, that it is only those emulsions which are originally defective that deposit so thoroughly, as in the case of the alkaline ones; and, as regards an unwashed emulsion, the deposited bromide under the action, perhaps, of the soluble matter present seems to agglomerate into coarser particles, which it is impossible afterwards to reduce to their previous state of fineness. The action of the alkali by reducing the suspending power of the collodion facilitates the deposition of the bromide; but to prevent its passing into the coarser form some other substance is necessary to curb the tendency—a function which is performed in Mr. Johnston's emulsion by albumen.

But the point we desire to call special attention to is this, viz., the emulsion we have spoken of as supplied to us by Mr. Johnston was not a washed one; that is to say, it contained besides the silver bromide free ammonia and the by-products of the double decomposition which takes place in sensitising, and which required to be removed from the film before drying it. After the treatment it received at our hands, however, it forms if not a "washed" emulsion at least its equivalent, and may be used in all respects in the same manner. Also, though it is now some months since it was re-emulsified, it is in every respect as good as, if not, indeed, better than, at first, showing that though probably slight traces of soluble matter may remain they are not sufficient to interfere with the successful working of the emulsion.

It is, then, evident that we possess a new means of removing the soluble matter from emulsions without submitting them to the ordeal of washing or precipitation, which, as all know, requires a special description of pyroxyline. As a rule, in fact as far as our own personal experience goes, invariably, even with the most suitable pyroxyline, a washed emulsion is, *cœteris paribus*, more difficult to intensify than an unwashed one. This does not necessarily imply a defect, for it is a matter of little difficulty to prepare a washed emulsion which shall be capable of rendering any desirable amount of density; but the difference between the two forms is that, whereas, in the one case intensity has to be worked for, in the other it almost forces itself. The alkaline emulsion exhibits the same facility in intensification as an unwashed one, at the same time possessing great rapidity. There is one other respect in which an emulsion prepared by this method is likely to offer an improvement over an ordinary washed one. It will have been noticed that an emulsion of the latter form, after keeping for a considerable time—eighteen months or two years—commences to show a slight texture or reticulation upon drying the film, as if the collodion had commenced to get rotten. Plain or bromised collodion prepared from the same pyroxyline does not exhibit the same tendency, hence it would seem that some important constituent of the collodion is removed in washing and its stability thereby impaired. However, as it is not a matter of necessity that the pellicle should be dissolved so long beforehand as the time we mention, this defect is, perhaps, not one of great moment.

If we desire to avail ourselves of the peculiar properties of alkalies in connection with emulsions we have to find out first the best alkali to employ, the best method of applying it, and the best substance to counteract its injurious action on the silver bromide. The process, moreover, must be such, in order to render it practically useful, that the full reaction shall take place within a reasonable time, as it would prove highly inconvenient to wait for weeks or, perhaps, longer for an emulsion to ripen and deposit its silver bromide. Our experiments have so far shown that there is no difficulty in securing the total deposition of the silver in twenty-four hours; but the more rapid the deposition the more difficult does it become to obtain the sensitive material in a satisfactory state for re-emulsification.

We have spoken in general terms of the use of alkalies, but probably, in practice, ammonia will be the one generally employed, though potash, from its easy solubility in alcohol, may also prove useful. As to the form in which the ammonia is used, the double salt is, we believe, not obtainable commercially, though it may be readily prepared, and we have followed that plan in our own experiments. We have also added strong liquor ammonia separately to an emulsion, sensitising in the ordinary manner with silver nitrate. Caustic potash appears to be less manageable than ammonia; but this may be due to the employment of stronger doses of the former, as we find some difficulty in adjusting the respective values of the two.

The addition of either ammonia or potash, or the use of the ammonio-nitrate of silver with ordinary collodion—that is to say, collodion which has not been specially prepared by the addition of one of the substances we shall mention—produces no immediately apparent result, unless it be the formation of a richer-coloured emulsion; but, as the change progresses, the silver bromide rapidly passes into the coarse stage and loses the warm orange or ruby tint which originally marked it, and in the course of a few hours will be found to deposit in an entirely useless state. By the addition of one of the "restraining" substances, however, not only is the change in the state of the bromide arrested, but its deposition is also very greatly retarded, so it will be seen that as we rid ourselves of one trouble we develope another, the happy mean resting in a proper adjustment of the proportions of the alkali and restraining agent.

In the latter capacity we have tried, in addition to albumen, shellac, Canada balsam, and various oils, including olive, linseed, and castor. Albumen, we know, produces very good results, but a considerable time is required for the emulsion to deposit. Shellac is a convenient substance to employ; but its action as a restrainer in this connection does not appear powerful enough. The same remarks apply to Canada balsam, which, if used in any but the smallest proportions, seems to arrest to a great extent the combination of the silver with the bromides. We have so far secured the best promise from the last class of substances—the oils—in the order they are named. Their restraining power is very remarkable, as an emulsion which would otherwise be entirely deposited in a few hours will remain unchanged for weeks with the addition of three or four drops of oil to the ounce. We had thought that such an addition without the alkali to an ordinary emulsion previous to washing would prevent the injurious action of the water upon the pyroxyline; but, unless the proportion of oil be extremely small, the film, even after washing and re-emulsification, is so repellent as to require development in a dish.

We shall return to this subject when our experiments are in a more advanced state. Up to the present time we have not been quite successful in the rapid precipitation of the emulsion; but we are in hopes that some samples we have now in progress will give better results, and perhaps open up something new. Finally: by rejecting collodion altogether as the vehicle for holding the bromide during its formation we think it possible the plan may be simplified.

ON IODIDES AND BROMIDES.

Of all the chemicals employed in photography it is essential that the iodides and bromides should be of the utmost purity, and there is no doubt that at the present day they are to be obtained commercially in a state nearly approaching purity. At the same time there are in the market samples of these salts which are by no means like Cæsar's wife, and particularly some whose origin is not English. It is not so much that they are adulterated as that they contain impurities likely, for instance, in the first place, to mislead in calculating the proportionate amounts of silver equivalents; and, in the second place, to give results not in accordance with just anticipations.

Thus, one of the commonest accompaniments of even potassium iodide—the most easy salt to render pure—is the iodate of potassium. It can be got rid of by exposure to intense heat, and with a lesser heat if charcoal be added, the iodate losing its oxygen and becoming converted into iodide. Another very common accompaniment of the iodide is the carbonate, which is easily tested for by the addition of an acid, any effervescence occurring showing its presence without doubt. The addition of a very small crystal of iodine is also recommended as a test for both carbonate and hydrate; if it fail to colour the solution, or decolorisation quickly follow a first display of colour, it may be inferred that one or other of them is present. Hydrochloric acid is often recommended as a test for the presence of iodate, but if it be not quite free from uncombined chlorine the test would be inefficient, on account of the re-absorption of the liberated iodine that would take place when the impurity was not present in large quantity. Perhaps the simplest and best test is the dropping of a small crystal of tartaric acid into a solution of the suspected iodide, when, if iodate were present, a yellow zone would be formed round the crystal.

Another salt not infrequently to be found in iodide is the bromide, and the prices of the former have sometimes ranged so high that as an actual adulterant it has been worth while to use it. We have, however, rarely come across a sample in which there was so much present as to justify us in believing it had been wilfully added.

The bromide may be tested for bromate, chloride, &c., in a manner analogous to those we have just given for the iodide. If the presence of iodine be suspected it can generally be got rid of by boiling with excess of bromine water, while, if the bromine is of uncertain character, any chlorine it might contain could be disengaged by the addition of bromide of potassium. It has been recommended that in place of using the impure hydrate of the alkali in the manufacture of these salts, a pure bicarbonate should be employed to ensure purity of results.

It is very desirable that at the outset materials of as pure a nature as possible be employed, for these salts are very difficult to free from the impurities named; they crystallise together with great closeness.

Greater stress is laid by us upon the potassium compounds—not only because they are typical and of greater commercial importance, but because, also, they form the stepping-stone to other salts. Thus ammonium bromide may be made of a very pure quality, as follows:—Dissolve four troy ounces of potassium bromide in six fluid ounces of boiling water, and three troy ounces of ammonia sulphate in four and a-half fluid ounces of boiling water. After mixing the two solutions together they are to be left to cool, and then have added to them one and a-half ounce of alcohol and to be allowed to rest for twenty-four hours.

Many processes are adopted for the manufacture and purification of iodides, but most of them possess some disadvantage. For instance: the one that perhaps may be considered to be in commonest use, which involves the employment of iron, is apt to cause the development of free hydracids and halogens in the course of time, unless the salt has been exposed for a long time to a high temperature, and this, we need not say, is out of the question with ammonium salt, for example.

Iodides also are prepared from hydriodic acid, in the manufacture of which, again, sulphuretted hydrogen is employed. There is a very natural prejudice against sulphur in any form among photographers. Again: when the acid is prepared by the aid of amorphous phosphorus it has been found that the salt so obtained is difficult to crystallise, and is contaminated by a slightly red colour—probably from the phosphorus.

We recently noticed in the pages of a scientific contemporary brief particulars of a new method of preparing iodide and iodate, which seemed to us elegant, practical, and, above all, likely to furnish a product of uniform purity. We will describe it and place in juxtaposition a brief account of the most commonly employed method—that with iron. It will, of course, be understood that there is no practical use for iodates in photography, but some of the iodates are easily converted, as we have described above, by the aid of heat into iodide; from these others again can be obtained for the production of which heat would be unsuitable. Baric hydrate is dissolved in hot water in the proportion of two parts to four of the latter; three parts of iodine are then to be added, and the solution filtered when neutral and colourless. The reaction is described as follows:—

$$6\,Ba\,H_2\,O_2 + 12\,I = Ba2\,10_3 + 5\,Ba\,I_2.$$

The precipitate, consisting of iodate of baryta, may be used for the production of iodates by adding any soluble sulphate, thus:—

$$Ba2\,10_3 + (NH_4)_2\,SO_4 = Ba\,SO_4 + 2\,NH_4\,IO_3.$$

The filtrate contains the iodide of barium, which may be used either for producing hydriodic acid by adding sulphuric acid till no further precipitate is produced, or by double decomposition with any sulphate for the production of a corresponding iodide, thus:—

$$Ba\,I_2 + Mg\,SO_4 = Ba\,SO_4 + Mg\,I_2.$$

A somewhat similar process, which was pointed out years ago, but was not commercially practicable, consisted in the mixture of baric peroxide and iodine to produce iodide of barium with evolution of oxygen, thus:—

$$I_2 + Ba_2\,O_2 = 2\,Ba\,I + O_2.$$

The iron process is much more complicated, being briefly as follows:—A solution of ferrous iodide is prepared by digesting iron and iodine, in a stoppered vessel, with water, the solution being decanted after a while and more iodine added. Afterwards it is boiled, and potassium carbonate added in small quantities so long as effervescence ensues, and a precipitate is formed. The solution filtered from this precipitate is evaporated to a proper strength, and then yields a crop of iodide of potassium crystals; but there is waste in the precipitate from the persistency with which some of the iodide clings to the ferroso-ferric oxide of which it is composed. We think there can be no doubt as to the relative simplicity of the two processes, and are in hopes that it may be the means of offering still greater facilities for the production of these important photographic chemicals.

THE PHOTOGRAPHIC EXHIBITION.

[Fifth Notice.]

We have frequently had occasion to speak of the artistic taste displayed by Mr. William Cobb, who has composed and photographed many very fine little pictures. In No. 343 we have a frame containing four of Mr. Cobb's *genre* pictures, cleverly conceived and well executed, his *Basket Maker* and *Pity the Poor Blind* (342) being probably the best. Mr. Edwin Cocking exhibits only one picture, *Cross Purposes* (472), a scene from "The Happy Pair." Mr. Cocking must be congratulated upon having made the picture tell its story in an able and unmistakable manner. The "happy pair" are looking very much as if between them a storm were impending. Mr. H. Garrett Cocking's *Interior of St. James's Church, Hatcham* (224), will be examined with much interest, if only on account of certain "disturbances" of which it has recently been the scene.

The *Good Morning* (186) and *Feeding Time* (187) of Mr. Warwick Brookes are attractive and telling photographs. Another picture, *At the Well* (137), by this artist, suffers from being hung so very low as to be examined with difficulty. Mr. J. Bowen's *Wedding Party* (323) appears to be effective, but it is placed so high as to defy the cognisance of the visitor. The same remark will apply to many other exhibits; for example, a portrait of Mr. Glaisher, the esteemed President of the Society (285), the name of the artist not being entered in the catalogue in our possession. In every exhibition somebody or other *must* be "skied;" but certainly so excellent a likeness of such a worthy man might have been placed a little lower down, so as to be brought within the ken of ordinary vision.

Two pictures by Mr. Cutchey (486) are suggestive of the admirable effects to be obtained during hoar frost. It was, if we mistake not, the Earl of Caithness who, well nigh twenty years since, first showed the exquisite beauty of pictures to be obtained when the thermometer was low. Query: is the Earl of Caithness quite dead—to photography? In numbers 48, 49, and 50 we have three warmly-printed, nice-looking views by Lieut. L. Darwin—Betchworth Park, Sheire, and Albury Park furnishing the respective subjects.

On the table is an album containing a large number of photographs of *Yachts* by Mr. W. Durrant. These have presumably been taken in Torbay, from the fact of the beautiful town of Torquay forming a background to many of them. Those of our readers who have tried to photograph yachts cannot have failed to perceive the great difficulty there is in securing them at a time when the masts are in a state of repose even for a second or two, the slightest agitation of the water communicating to the top of the slender mast a swaying motion that interferes considerably with the success of the final pictorial result. Some of these yachts display repose in its most charming aspect; in others all is action; while each forms a picture which is "a thing of beauty." In one—a view *On Board of the Gladys*—such of the visitors to the exhibition as are acquainted with the physique of Mr. H. P. Robinson will not be slow in discovering that eminent photographer occupying a prominent position among those grouped on the deck; and, speaking from an experience of three or four portraits of this gentleman, the one in question is by far the best we have seen. In frames numbered respectively 150 and 151 are also shown other pictures of yachts by the same artist, and possessing equal merit with those in the album.

Mr. Donald's portrait of the Rev. George Gilfillan is hung too high to admit of its being properly viewed, but two other pictures (325-6) are more favourably situated for observation. The latter, representing a child personating its grandmother, is an excellent work.

On one of the screens are several photographs of statuary, by Mr. J. W. Edwards, lighter shadows in which would have contributed to their improvement. A great advantage to the *Studies Near Reigate* (470) of Mr. Bellchambers would have accrued had the skies not been quite so "pronounced," and the same remark will apply in connection with the pictures of Mr. Johnston, of Forres, the accessories in this latter case detracting from the principal objects.

Mr. James Paton exhibits a frame (478) of domestic interior views, which display both ingenuity and artistic ability. They are entitled *Studies* (chromotype prints from untouched negatives, showing a method of lighting). Two portraits by Mr. Howie (438 and 443) doubtless represent persons of eminence, but the catalogue does not inform us *who* they are.

Of the various exhibits of Mr. W. Gillard we like No. 318 best—*Toddie*—which represents a little child in the conventional attitude of "saying prayers."

Mr. H. A. H. Daniel exhibits several well-selected views of pictorial subjects, their treatment being all that could be desired. Among these *The Brook* and the *Old Bridge* invite more than a passing look.

We find in our note-book commendatory memoranda of portraits exhibited by Messrs. Barry and Co., R. Barnes, Denelan and Blake, Done and Dudman, W. Shuter, and Wolstenholme Brothers; and, duly noting these, we observe two frames of landscapes, representing woodland and river scenes, by Mr. E. Brightman (116-7), charmingly executed; also a similar collection of views by Messrs. W. Bates, Hollebone, Lisden and Son, and F. W. Reynolds.

In our next we expect to conclude these notes on the pictures in the Exhibition; and meanwhile direct attention to the medal awards, which will be found in another page.

MR. J. R. JOHNSON'S NEW IMPROVEMENTS IN CARBON PRINTING.

As we have already announced, a patent has been obtained by Mr. J. R. Johnson for certain improvements in carbon printing. The late hour at which the specification reaches us, and our desire to lose no time in making our readers aware of the nature of these improvements, prevents us from offering any observations upon the novel points of the invention. Accordingly, we confine ourselves at present to the publication of the specification, which is entitled "Improvements in Photography as Applied to the Preparation and Treatment of Pellicular Negatives, Transfer Pigment Printing, Pigments and Pigment Paper, and in Appliances to be Used Therefor."

This invention consists of sundry improvements in the photographic operations by which pictures are obtained in carbon or other permanent pigments, a process which has also been called "the autotype process," or autotypy.

As ordinarily practised this is well understood, many editions of the *Manual* of the autotype process, originally written by the inventor of these improvements, having been published.

My improvements will be best described under two heads or chapters. A. Those which relate to the double transfer process. B. Those which relate to the simple or single transfer process, some of which will be found of important use for other processes of photography, viz., whenever a negative has to be taken and preserved.

My first improvement consists in the substitution of alizarine, the colouring principle of madder—well known to be properly stable when combined with an earthy or metallic base—instead of the fugitive preparations of cochineal hitherto used for obtaining the brilliant purple tones for pigment prints. Small quantities of alizarine have already been used combined with other colouring matters, such as Indian red; but when sufficient is employed in the usual way to give the red tint alone, the paper employed to receive the finished proof becomes stained red or pink instead of remaining white, or the pigment paper becomes insoluble even when not exposed to light. As is well known, alizarine is soluble in alkalies and their carbonates, and is precipitated therefrom as a coloured lake by the earthy and metallic salts, and particularly by alum, which yields a brilliant red lake, and by sulphate of zinc, which yields a purple lake. But the salts of alum and zinc also precipitate gelatine, which is the basis of the compound used for preparing the pigment paper, so that when sufficient alum is employed to fix or render insoluble the alizarine lake, that lake, when mixed with the gelatine and bichromate of potash to form the pigment paper, renders the pigment compound insoluble and unfit for use, or it becomes so by keeping. I avoid this result by employing sufficient aluminous salt to produce the full red colour, and afterwards add a lime or magnesian salt to effect complete insolubility. I thus obtain the brilliance and permanence due to the alizarine without rendering the gelatine insoluble. The alizarine of commerce is so variable in quality and strength that it is impossible to give very definite quantities for the preparation of the lake. I find, however, that for every part of dry, real alizarine, about five parts of liquid ammonia (liquor ammonœfortis of the pharmacœpia of London), five parts of pure ammonia alum, and five parts of chloride of calcium, or eight of sulphate of magnesia, are required. The alizarine is dissolved in the ammonia with 100 parts of water, and the alum in solution is added. When well mixed the chloride of calcium is added, and the precipitated lake cast upon a filter and dried on chalk stone, as is well understood. The salt of lime is in excess; but such excess is not precipitated, but remains insoluble.

A pigment paper made by a mixture of China or Indian ink, or other black pigment, and alizarine lake, so as to have a rich maroon or amaranth tint, may be "toned" by a weak solution of perchloride or persulphate of iron, to which a few drops of hydrochloric acid have been added, in the same way as the tints produced by a salt of silver are "toned," or turned from red to violet by the salt of gold.

I claim the use of alizarine lake formed by alumina mixed with lime magnesia, or other earthy matter capable of fixing the alizarine without rendering insoluble the gelatine when employed for pigment paper. And I claim the mode described for "toning" prints produced by such lake or lakes.

My second improvement consists in a new method of preparing the pigment paper, and of sensitising the same when already made, but made insensitive—that is, without the bichromate.

It has been usual to spread the gelatine pigment compound upon the paper in as cool a place as possible, and immediately to hang it up to dry in such cool, airy place. In the same way, when the paper is made insensitive it is rendered sensitive by immersion in a solution of the bichromate of potash or other bichromate, and is then suspended in such cool, airy room.

I operate in a totally different manner. After spreading the gelatine compound upon the paper, or after plunging the already prepared paper into the bichromate bath, I lay it flat upon a level surface upon a plate heated to 90° or 100° Fahrenheit, and I maintain the wet pigment paper in this position for from fifteen to thirty minutes, by which time the denser particles of colour have settled to the lowest stratum of the pigment compound, particularly such heavier or larger particles as have escaped filtration, or which have clogged together during the preparation, and which would form a blot or spot upon the ultimate picture. Papers so treated, having a less dense pigment compound on the surface and a denser compound below, yield more delicate half-tones, and more vigorous shadows than paper made in the ordinary way; and, as water is lost during the heating, the compound becomes more concentrated and does not run from the paper when suspended in warm weather. In a hot atmosphere the duration of the heating operation while the paper is in a horizontal position may be considered greater than has been stated. It is scarcely necessary to say that the paper so treated must either be allowed to cool before being suspended vertically, or the operation must last till the gelatine compound is too thick to run. It is important perfectly pure bichromate salt be used, that a small part of the bichromate be converted into neutral salt to ensure the compound from the presence of free acid.

My third improvement consists in substituting for glass or porcelain, used as the temporary support for holding the print by suction during the development, card or millboard made by some waterproof cement instead of by paste or glue, and with a white, highly-polished face of paper prepared with shellac or other waterproof substance. Or I use sheets of tinned iron or zinc faced with such highly-glazed impervious paper, such paper being attached to the metal by india-rubber or marine glue, or dissolved shellac, either by direct application to the face of the metal, or by folding over the edges of the paper and attaching the edges by cement behind the plate.

Such prepared paper may be renewed when worn out, *ad infinitum;* and after each operation of developing a picture it has only to be rubbed over by a flannel, and a little wax and resin dissolved in benzine, as is well understood, to be ready for another operation.

Such prepared panel is not only much more easily handled than the flexible supports hitherto used, whether made of a simple coating of shellac (see first edition of Autotype *Manual*), or the more complex coating used by Mr. Sawyer, but is far more economical, as when attached to the panel or plate it may be used a great number of times without renewal.

I claim the use of cardboard made impermeable to water, and sheets of metal coated with prepared paper, as the temporary support in obtaining a non-reversed proof by pigment printing.

It is usual after the print has been developed upon the temporary support, and has been fixed by immersion in alum to allow it to dry, and afterwards to transfer it to prepared paper called the "second transfer paper."

Instead of thus operating, my fourth improvement consists in treating such print after leaving the alum bath, and having been rinsed well in water, to allow the washed print to drain well; but before drying I coat it with a gelatine solution rendered opaque by zinc white or other white pigment. After thus coating the plate, or sheet of cardboard, it is placed in a horizontal position, and when the film of white gelatine has set or solidified, a thin bit of tissue or other thin paper is wetted in water and laid upon the solidified gelatine. A little pressure with a brush or sponge causes the paper to adhere, and when the whole is dry it may be removed to be mounted subsequently on cardboard, or it may have the cardboard mount applied before being taken from the glass. Or, instead of the intervening paper, the card mount may be applied directly upon the gelatine and pressed thereon. After the pressure has been continued for some time the card will have become permanently fixed. I would, however, observe that when the negatives are old or imperfect, and the prints require much touching, and particularly when the prints have been developed upon collodion, to be described, the direct application of the white while the print is in the wet state cannot be made. In these cases the print must be allowed to dry before the touching or spotting to correct the defective prints is made, and the gelatine and white must be applied subsequently. I prefer, however, to give to the wet prints before drying a thin coating of gelatine, or of gelatine and chrome alum, to fill up the hollows and support the relief which defines the picture during the drying operation. Pictures so treated are greatly superior to those which have been allowed to dry without such treatment. I do not, however, claim the use of transparent gelatine, but that only in which the gelatine has been made opaque to replace the more or less costly double transfer paper—not only on the ground of its economy, but that the results are greatly superior, being, in fact, equal in every respect to a single transfer print upon opal glass.

My fifth improvement consists in the use of a solution of gelatine—say, of four per cent. strength—rendered insoluble when dry by a small quantity of chrome alum, as is well understood, instead of the usual collodion coating for preparing the temporary support when a polished surface is required. I pour this solution on the plate prepared by wax or stearine, as is usual when collodion is used; I allow it to dry, and before applying the print I pass the prepared plate into warm water to soften the gelatine and remove the excess of chrome alum. After this treatment the insolated print must be applied to the gelatine coating and the development proceeded with as usual when collodion is employed.—I claim the use of the well-known gelatine solution for this purpose.

Chapter II.—My first and chief improvement under this head of my invention consists of a new method of obtaining reversed negatives, without which, as is well known, prints produced by the single transfer process of pigment printing are themselves reversed, as when an object is viewed in a mirror or looking glass.

The only certain mode of removing the collodion film from the glass upon which it has been taken, so as to apply it to print upon the side in contact with the glass, consists in pouring upon the negative a solution of gelatine, allowing the gelatine film to dry, for which from twelve to twenty-four hours are required, according to the thickness of that film upon the dry gelatine; a coating of collodion is then poured, which is again allowed to dry, and the compound pellicle with the adhering negative is detached from the glass.

Instead of this tedious preparation, which renders the negative incapable of being employed for printing for so long a period, I prepare the double film of gelatine and collodion beforehand upon a clean plate prepared with a film of wax or stearine, and I apply it when detached to the surface of the finished negative; but, as is well known, such application cannot be made directly, as the gelatine wetted swells, extends, and curls up, and cannot be made to adhere. I avoid this difficulty by immersing both negative and double pellicle in water to which sufficient alcohol has been added to prevent the absorption of the water by the gelatine, and its consequent extension and retraction, and by using this fluid slightly warmed to a greater or less degree, according to greater or less quantity of the alcohol. In practice I find equal parts of rectified spirits and water and a temperature of from 80° to 90° to give the best results; but there is a wide margin as regards the liquid, and the adhesion takes place even without artificial heat in summer weather. As soon as the gelatine begins to dissolve without the preliminary swelling—and when this is observed the surface of the gelatine and that of the negative are brought together under the mixed fluid, and are lifted simultaneously out of that fluid and placed upon a horizontal support—a piece of oiled paper or oiled silk is then laid over them and pressure given by the squeegee or other means. When quite cold the two surfaces will be found united, and the pellicular flexible negative may be lifted from the plates, and if placed between the leaves of highly-dried paper under pressure it will dry rapidly, quite straight, and may be used immediately with either side of the negative applied to the sensitive paper. Such pellicle negatives may be worked up exactly as if on glass when prepared by varnish or otherwise for that purpose.

I have alluded above to a double pellicle, as this is the best I have found for the purpose; but it is evident that a simple sheet of gelatine of commerce may be substituted, the only disadvantage being that it is acted upon by moist air unless protected by a coating of collodion or varnish. It is equally obvious that a sheet of paper made more or less transparent, coated with gelatine or some other adhesive hollow body, may be used. I also find that such bodies, viz., a sheet of stout collodion, a sheet of talc, or porous paper may be attached to negatives in the way described by introducing into the warm weak spirit a portion of gelatine in solution. The manipulations are the same, sufficient gelatine to effect the adherence of the surfaces being left after the action of the squeegee.

As is well understood, the glass must be prepared with an infinitely thin stratum of wax before applying the collodion to form the negative to be removed from the glass, or if this be not done the finished negative must be immersed in water acidified with chlorhydric or citric acid, and maintained therein until the pellicle show signs of becoming detached; and if the negative has been varnished, such varnish must be removed by a solution of a caustic alkali or spirits of wine before being placed in the acid bath, as is well understood. It must then be washed in water to remove the acid, and is ready for immersion in the water and alcohol.

When the negative is large, or where great definition is not required, instead of the gelatine and collodion pellicle I use paper made transparent, coated with a solution of gelatine or gelatine and chrome alum, and I apply it to the negative exactly as a carbon print is transferred from the temporary to the permanent support, as is well understood; and when the negative is very large I prefer to operate in a different manner. I coat the edges of a large sheet of plate glass with a solution of caoutchouc, or as if for the preparation of a dry collodion plate. Upon this plate I apply a sheet of thin transparent paper, which has been wetted with a one-per-cent. solution of bromide of potassium in water. When this paper has dried I apply a coating of bromide of silver emulsion, diffused either in collodion or a solution of gelatine, and I develope and fix the negative after exposure in the ordinary manner. When the finished negative has become dry I apply another sheet of transparent paper previously coated with gelatine or gelatine or chrome alum, as before described. The negative is thus imprisoned between two sheets of transparent paper, either of which may be worked upon by a lead pencil or stump to any extent.

It is obvious, that even if the negatives are not required to be reversed, the process described offers great advantages:—1st. On the ground of economy, plate glass being replaced by gelatine and collodion. 2nd. For transport or transmission by post. 3rd. For facility of storage &c., &c.

I have described the transfer as taking place upon plain pellicle or paper, but pellicles or paper with a printed border or an inscription may be employed. Or a second negative or carbon print on a transparent medium may be used as the transporting film if the negative and pellicle negative have been taken each with an appropriate mask or "*cache*," as is well understood. Again: such transferred negatives may be trimmed with scissors and inserted in appropriate negatives in which a space has been left transparent, so that the doubled negative may yield pictures with frames or borders, or figures with landscape backgrounds or other combination.

I claim the mode of transferring negatives described, simple or compound.

My second improvement in single transfer pigment printing consists in substituting for the usual single transfer paper a card or board formed of two or more layers of paper cemented together by bleached shellac dissolved in liquid ammonia or in a solution of borax, or by marine glue or other cement insoluble in water. By this means no mounting of the ultimate print is required. I apply this process to the prints of enlargements which are thus obtained upon the board to be used without any intermediate mounting and to the printing of *cartes-de-visite*, the pellicular negatives being trimmed to the proper size and mounted with or without borders upon a sheet of plate glass. Such collection of negatives may be rendered capable of being printed simultaneously by proper selection if many are used, so that only negatives of equal printing density are employed on the same plate. If this be not possible, the negatives less dense than the others are brought to the same degree of translucency by the addition of gelatine pellicle to to the back, or by transparent paper, as is well understood. On cutting the negative to the proper size allowance should be made for the "safe edge," the line of opaque, or nearly opaque, varnish round the picture, although this is scarcely necessary in single transfer printing, unless the pigment paper be too soluble, or the prints require to be greatly reduced from excess of density from over-printing. Any number of negatives may be thus printed together, but it will be convenient probably to arrange them in dozens in such a manner that they have only to be cut horizontally and vertically by the shears or cutting machine to yield one dozen *cartes.*

In the preparatiion of the paper card or panel described I prefer that such paper, &c., have a film of opaque white over the surface to receive the print in order to hide the grain of the paper.

Enamel paper has not hitherto been successfully used for single transfer paper, as when the pigment for producing the enamel surface is used in sufficient quantity for this purpose it becomes stained by the bichromate of the pigment compound. I find, however, that if kaolin or china clay, or starch, or other substance not combining with the chromic acid, be employed as the pigment to give the enamel facing no such stain occurs.

I substitute one or more of these substances for the zinc or lead or barytes white hitherto employed for facing or enamelling paper, and proceed in the ordinary way to prepare paper, preferring that this be as thin as can be successfully used. When this coating is dry it is cylindered in the usual way, and upon the prepared surface I apply a solution of the well-known gelatine and chrome alum compound, which is well known.

My third improvement consists in the use of an extremely thin paper for preparing the single transfer paper, chiefly for the production of prints for illustrating books, so that the mounted pigment photograph shall not be materially thicker than a print from an engraving upon India paper. I obtain such paper by immersing very thin *papier vegetale* or tracing paper into a solution of white shellac in liquor ammonia to which a portion of albumen has been added. Say shellac two parts, strong liquor ammonia one part, albumen of egg one part, water twenty parts; dissolve by gentle heat, and filter.

Notwithstanding the extreme tenuity of such paper it withstands perfectly the operation of washing and fixing, having become waterproof by the treatment with shellac.

I treat all the prints produced by single transfer, after becoming dry and having been "touched" or "spotted," if necessary, with a weak solution of shellac, like the above, but in which the albumen has been replaced by one-third its weight of glycerine. Such prints, after being rolled or burnished, have a sufficient polish, but if more be desired it can be obtained by polishing the prints with a little alcohol and linseed oil, applied as in finishing French-polished furniture. Or the prints may be enamelled with collodion and glycerine, applied on the surface of a plate of glass, as is well understood.

Having thus described and particularly set forth the nature of the said invention and the manner of carrying the same into effect, I would have it understood that—

I claim under the first improvement the use of alizarine lake formed by alumina mixed with lime magnesia or other earthy matter capable of fixing the alizarine without rendering insoluble the gelatine when employed for pigment paper, and I claim the mode described for "toning" prints produced by such lake or lakes.

I claim under the second improvement the method of preparing the pigment paper by subjecting it to the temperature on a level surface as therein described.

I claim under the third improvement the use of cardboard made impermeable to water, and sheets of metal coated with prepared paper as the temporary support in obtaining a non-reversed proof by pigment printing.

I do not claim under the fourth improvement the use of transparent gelatine, but that only in which the gelatine has been made opaque to replace the more or less costly double transfer paper as therein described.

I claim under the fifth improvement the use of the well-known gelatine solution for the purpose therein described.

In the second division, or Chapter II, I claim under the first improvement the mode of transferring negatives described, simple or compound.

I claim under the second improvement in single transfer pigment printing the use of a card or board formed of two or more layers of paper cemented together as therein described, and the use of enamelled paper prepared with kaolin or starch, or with some equivalent substance which does not combine with the ingredients employed to form a stain on the whites of the picture.

I claim under the third improvement the use of thin paper prepared by immersion in the solution therein described. J. R. Johnson.

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Referring to the discussion which recently took place in our columns, with regard to the colour of dry-plate films and its relation to the state of division of the silver haloid, we should like to know if any of our readers have noticed and can explain the following curious fact in connection with films of bromide of silver. It frequently happens from various causes that the colour by transmitted light of these films is almost, if not entirely, free from any trace of the ordinary orange or ruby tint, verging in extreme cases to violet, lavender, and sometimes green. Now, if a film of any such abnormal colour be gently rubbed with the ball of the finger it will be found gradually to acquire more and more of a ruby tinge, passing through various shades until the full effect is attained. A film which is only slightly deficient in the orange has its colour perceptibly "warmed" by this treatment, but where that colour is as strongly marked as is ordinarily the case in workable plates no further effect is produced. Further: in rubbing it will be generally found that the film is covered with extremely fine scratches, the majority not penetrating the whole thickness, and these, as the rubbing is continued, assume a much more decided tinge of orange or ruby than the remaining portions. "Tinge," indeed, is not the correct term, for, when fully developed, the new colour is quite as brilliant and pronounced as an emulsion film of good quality. Commencing with a film of a lavender or greenish-violet colour, we have been able to produce nearly every shade from blue to red, though the intermediate tints are not so well marked as the extremes. We do not venture on an explanation of the phenomenon, but merely record it for the benefit of those of our readers who are curious in such matters; and, if it be not of any immediate value or importance, who knows but it may some day assist in the solution of some knotty problem in connection with the colour and sensitiveness of emulsions?

THE AWARD OF MEDALS AT THE PHOTOGRAPHIC EXHIBITION.

The following is the list of medals awarded for the best pictures at the exhibition of the Photographic Society of Great Britain:—

For two Pictures which in the opinion of the Jury display the greatest general excellence:—

No.
281. "When the Day's Work is Done" ......H. P. Robinson.
241. "Tired Companions"..................G. Nesbitt.

For the best Landscape 10 × 8 *and under, and for the best above* 10 × 8:—

117. "Wickham Bridge" ....Edward Brightman.
501. "Ullswater" ....Payne Jennings.

For the best Portrait above 12 × 10:—

276. Hugh Owen, Esq., F.S.A. ....Valentine Blanchard.

For the best Figure Study 12 × 10 *and under, and for the best above* 12 × 10:—

334. "Keolanthe" ....Valentine Blanchard.
383. "Portrait" ....O. Angel.

For the best Enlargement untouched, and for the best Enlargement and Negative, both being the work of the Exhibitor:—

83. Enlargement by Solar Camera ....Dr. D. van Monkhoven, Ghent.
5. "Windsor Castle"......................Autotype Company.

For the best Genre Picture:—

472. "Cross Purposes." Scene from "The Happy Pair"......................Edwin Cocking.

For the best Photo-mechanical Prints:—

433. Frame exemplifying Woodburytype ....Woodbury Company.
541*a*. Buildings, Views, Plans, &c. ....Strumper & Co., Hamburg.

For the best Frame of Dry-Plate Photographs:—

150. "Shipping"..........................W. Durrant.

For the best Instantaneous Picture:—

26–34. Swiss Views ....William England.

For the best Microphotograph:—

105. Proboscis of Blowfly ....Edward Viles.

For the best Specimen of Surface Printing from Metal:—

414. Photo-relief Block ....Leon Warnerke.

Special Medals:—

101. Arctic Views ....W. J. A. Grant.
551*a*. Interiors ....Herrman Rückwardt, Berlin.

It will be observed from the above that several medals still remain unawarded—for what reason we are not informed. Thus: for the best portrait under 12 × 10, *none;* for *genre* pictures, only *one*, instead of the *two* offered; for the best study from animal life, *none;* for the best instantaneous pictures, only *one* instead of *two;* for the best six stereo. transparencies, *none;* and for the best apparatus, *none*. This latter is the more surprising, inasmuch as the excellence, both in design and execution, of some of the apparatus displayed on the table is universally recognised.

NOTES ON PASSING EVENTS.

By a Peripatetic Photographer.

Apropos of nothing: have many, or any, of my readers tried to photograph cats? With two or three well-bred and well-fed cats to fall back upon I don't know what might not be done by an ingenious photographer who possesses a quarter-plate lens and camera, together with the requisite knowledge of how to use them. A cat must not for a moment be compared with a baby, or with a restless sitter of any kind; for, if the stomach of the feline animal be moderately well filled, Tabby will allow you to pose her in positions even quite unnatural to her. The point of interest to photographers is that she will placidly retain such positions for three or four seconds without moving, by which time she has, by the skill of the photographer, been made a thing of beauty, pictorially speaking. Dogs are not quite so easy to photograph as cats; but, unless in the case of a frisky young animal that has not arrived at the years of discretion, he must indeed be a clumsy photographer who cannot manage to obtain a photograph of a dog, the picture possessing the utmost sharpness. Oxen and cows are likewise easily photographed, unless when the presence of flies or other irritating insects necessitate the tail of the animal being kept in a state of uninterrupted oscillation.

I may be wrong, but I imagine no photographic exhibition in London or elsewhere has evoked such a number of notices from the outside press as the present one. There is, too, a wonderful degree of unanimity in their expressions of high approval of the quality of the pictures. It is gratifying that photography is at least holding its own.

I read, with a certain degree of interest, the paragraph in The British Journal of Photography in which we were informed that the president of the Glasgow Photographic Association, Mr. John Stuart, had been elected provost of Helensburgh. From the Brighton newspapers I learn that a similar honour has been arranged to be conferred upon another photographer, Mr. J. E. Mayall, who this day will become the mayor of Brighton. Query: Why in an English-speaking country should such national distinctions of civic appellation as that of "provost" in the Northern portion and of "mayor" in the Southern portion of the same kingdom be retained?

Second thoughts are, perhaps, always better. When I read in your report of the last meeting of the Edinburgh Photographic Society Mr. Bashford's suggestion that at that meeting such items of practical interest as the coating of a plate with an albumen substratum should be shown and illustrated for the benefit of the younger members, I at first thought what a set of "muffs" those Northerners must be to necessitate the teaching of such a thing by example rather than by precept. On more mature consideration, however, I now think with that gentleman that such practical illustrations of the small things of photography would prove of inestimable value to many. There are numerous matters in which success depends upon a turn or twist of the hand, as it were, and adequate instructions in which could not be given by even the most lucidly-expressed verbal directions. Take such a simple case as the coating of a plate with collodion or gelatine: how much more would a tyro learn from *seeing* this operation once performed than from reading a description of the method recommended? A very remarkable instance of this once fell under my own observation. A gentleman—who was so far from being devoid of acumen that he had previously, and has since that time, successfully led a detachment of troops into action—once complained in my hearing that he could not get an image developed on a collodionised plate, although he had literally followed the printed directions given him. I watched him operate. Grasping the exposed plate by the near corner, he from a jug poured over the surface, and in a continuous stream, nearly a pint of iron developing solution, the plate—quarter-plate size—being inclined downwards so as to allow the developer to run easily off, which it did like a small waterfall. On my requesting to be allowed to have a glance at the instructions by which such a strange proceeding was warranted, I read as follows:—"Pour the developer upon the plate and the image will speedily make its appearance"—directions which, although literally true, were quite inadequate to meet the case of this gentleman, who in nowise contravened them. I developed a plate before him, and by that one illustration enabled him to get rid of all his troubles. I believe that one of the most "popular evenings" at either of the two London photographic societies would be one at which some dry-plate worker would explain and demonstrate before his wet-plate professional brethren the whole "mystery" of developing an image by the alkaline process. Yes; we want more teaching by demonstration than we have had.

It is pleasant to observe that the South London Technical Exhibition is not yet "knocked on the head," but is once more about to exhibit signs of vitality. Technical exhibitions of every kind are interesting to the classes for whom they are intended, and it would be a sad pity if such annual meetings as those of the South London Photographic Society should cease for want of support, or from mismanagement. May it never encounter such a fate!

SPOTS IN EMULSION PLATES.

I have just read with pleasure your leader in last week's issue, and am pleased to see that you are of the same opinion as myself as regards the improbability of nitrate of silver remaining in suspension in the finished emulsion. I have at different times used nearly all the known salts of silver (not confining myself to the nitrate alone) that were available for the purpose, and have observed the presence of small black specks at times, no matter what salt of silver I used.

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* Concluded from page 521.

Respecting the question of the small black specks, mentioned by both Mr. J. D. Radcliffe and also Mr. Herbert B. Berkeley, appearing mostly in the sky part of the negative, I beg to offer a suggestion, and that is that almost everyone who practises photography at times uses the wet process with the nitrate bath, and of course the single back is used for the wet plate, and, naturally, the drainings from the plate, from time to time, will find their way into the bottom groove, where the shutter goes in, and on drying recrystallises again as nitrate of silver; and the same single back is used for dry plates if required, and the continual use of the shutter grinds this residue into a fine dust. The sky part, being always the bottom of the negative in the camera, would come in for the greatest share of this fine dust of nitrate of silver and cause black specks as referred to by these gentlemen, especially if the shutter go down with a slam. I have no doubt there are many professional photographers at the present time who are trying emulsion photography having only a single back to their camera, and who may be troubled with these black specks at the nearest part of the plate where the shutter shuts in.

I may also mention another cause of small black specks which I noticed at one time, and it was this:—My light-tight dry-plate boxes were all filled with india-rubber pads, both top and bottom, known as "vulcanised," and small particles of the sulphurous compound in fine dust became attached to the plate all round where the pads touched. I had these pads removed, and plain rubber ones—such as are used for bath tops—put in their place, and the spots, or specks, ceased. But I noticed another fault, which was that where the pads touched, half-an-inch all round that part of the plate was rendered insensitive—no doubt due to some exalation from the rubber. I have now done away with the pads, and let the plates rest on the wooden bottom of the box. I never use india-rubber bands to put round the plates in packing them together (as some recommend) for the same reason.

I may also mention that at one time I took a number of valuable negatives by wet collodion, and had them all spoiled by using a new india-rubber vulcanised water bag. In this case I suppose the small sulphurous particles became detached, and, floating about in the water, were deposited on the plates; and, when dry, the plates were covered with thousands of small black specks, looking very similar to those in question on dry plates. I also notice with regret that most of our wholesale dealers in photographic prints use the elastic bands, and then wonder why the prints go spotty. I believe this may be the probable cause in this case. It is an old saying, in cases of disease, "find out the cause and the remedy is very simple." I hope, at some time, to be able to offer a few more suggestions on some other defects in emulsion photography that I have noticed.

Wm. Brooks.

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FOREIGN NOTES AND NEWS.

Non-Effect of Stormy Weather on Reticulation of the Film.—Comparative Expansion of Various Sorts of Prints.—The Photographer in Japan.—Gelatino-Bromide Plates.—Lighting the Dark Room.—Leon Vidal's Polychromes.

The *Mittheilungen* says its experience during the last stormy summer does not bear out Herr Ott's opinion that reticulation of the pigment film of carbon tissue is more likely to occur in the time of storm than at other times.

The same journal gives an account of an experiment made to ascertain the shrinkage or expansion of various sorts of photographs. Six prints were made by various processes from the same original, and when dried and trimmed they all measured exactly 147 × 100 mm.; they were then coated with a starch paste and found to have expanded as follows:—

	In length.	In breadth.
A steel blue picture	1 mm.	2 mm.
An uranium ,,	2 ,,	0 ,,
An aniline ,,	1 ,,	0 ,,
A carbon print, single transfer	1 ,,	0 ,,
A carbon print, double transfer from glass to paper	½ ,,	0 ,,
An ordinary albumen print	3½ ,,	0 ,,

All the pictures were finished upon Rives paper. The direction of the sheet was not previously determined. From these results it would appear that silver-albumen prints expand most and carbon prints least, thus confirming the opinion previously expressed by Herr Oscar Suck.

Baron Von Stillfried says that in Yokohama, Japan, he carries on his business almost entirely with the assistance of natives, each one of whom is only instructed in a special department—as, for instance, to polish plates or to sensitise paper—and knows nothing whatever of any other part of the work. At first he used to show his one assistant all the different photographic manipulations necessary to produce a picture, and the consequence was that he soon left and set up on his own account. The rate of wages varies from three to twelve dollars per month. The latter sum is paid to the best retouchers only. Portraits Herr Von Stillfried only takes occasionally, his chief dependence being upon landscapes, which are bought in quantities by European travellers. There are many native photographers in Japan. These conduct their business in the most primitive manner. They have only one small portrait lens, of the cheapest sort, with which they only take *cartes-de-visite*. They do not require to varnish their negatives, but print them right off, as a larger edition than two copies is seldom required. The negative is then washed off, and the glass serves for the next comer. One of these photographers seldom possesses more than three glasses.

From the *Moniteur de la Photographie* we learn M. Boivin's results of experiments made with Kennett's gelatino-bromide pellicle plates, prepared by M. Durand, of Saint Etienne. They were found perfect in all respects. The view selected was a country scene full of verdure, and was taken in ten seconds. M. Boivin considers that the process possesses great advantages, the drying of the plate being the part which is most delicate. It should be done sufficiently quickly, but so as not to allow ridges to be formed on the plates. They must be placed in a horizontal position with great accuracy, for without this care the films will be unequal in thickness. Also in preparing the plates it should be observed that rainy and moist weather interferes with the drying. M. Boivin finds the gelatino-bromide to have also great advantages in being so much more rapid than the emulsions made with collodion, seconds only being required with it where minutes are necessary with well-known emulsions. M. Boivin says that in respect of M. Chardon's emulsion he had received for experiment a sample from M. Fleury Hermagis, and found it excellent in all respects, although slow in action and high in price. He had obtained good plates by giving exposures of three to six minutes, where under the same conditions thirty to forty seconds only were required by another process.

M. Terpereau, of Bordeaux, forms screens of taffetas with yellow gum upon sheets, and these are placed one upon the other like scales, and tested by sensitive papers until the chemical rays do not pass. In this way the light can be regulated cheaply and efficiently for the dark room.

We have received a letter from our esteemed *confrère* M. Léon Vidal, with two specimens of photochromy obtained by the agency of the Woodbury process. He says that, after very long and delicate experiments, he has obtained photochromic proofs from the photoglyptic press with such success that the reproduction is absolutely perfect. M. Vidal considers the improvements of obtaining photo-mechanical plates so complete that they can be produced at commercial prices, and may form a new industry. One specimen represents an enamel, *Gaston de Foix*, which is surrounded with *repoussé* work in silver, and M. Vidal considers the reproductions of colours and metallic effects among the most interesting applications of photography. Another subject, *Marguerite de Valois*, is an example of the reproduction of the effects of fine metal work. Speaking of the impression made by these works upon the public, M. Vidal states that a rich financier, M. D. Rothschild, said that application need not be made for permission to copy any of the art-treasures of his cabinet, as these reproductions were such as to make him jealous of their being made too common by photochromy. The beautiful examples of M. Vidal may be seen at the office of this Journal, 2, York-street, Covent Garden, W.C.

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SCIENTIFIC JOTTINGS.

Purity of water and the means of ensuring it are an ever fertile source of interest to photographers, and quite recently a most interesting addition has been made to our knowledge—the means of obtaining pure water; but unfortunately for the present the exact nature of is not known. The medium consists of a new kind of filter of such remarkable power that solutions of so marked a character as strong tea and infusion of logwood became pure and tasteless water when they had passed through the filter in question, which was exhibited at the Guy's Hospital *conversazione*. It is well known that the production of absolutely pure water is a laboratory operation which is not of the simplest nature; the following method, however, though apparently intricate, is simple enough compared with many, and would be found useful when special experiments with solutions of silver, whose purity might be depended upon, were in progress. Sufficient permanganate of potash is added to clean rain water to give a decided red colour to it, and after standing for twenty-four hours a small piece of lime is added after transferring the whole to a copper still. After allowing about ten per cent. of the liquid to escape as steam after the application of heat, the bulk of the remainder is distilled and collected, and then redistilled in glass again, with the addition of a little lime. If the first portions of the distillate be rejected the remainder will be almost pure, and show not the slightest colour upon treating with the Nessler reagent. It would be still better to perform all the distilling in glass, and if absolute purity were required a still further distillation in glass should be undertaken after adding a little acid sulphate of soda to the before described last distillate, and rejecting a considerable proportion of the first product of distillation.

Mr. J. W. Swan has been making some experiments with hardened glass, and has come to the conclusion that it will not be of much practical utility. The details of experiments are interesting, and scarcely, we think, warrant a very sweeping condemnation. Thus: a basin, of *thick* glass, was, after being filled with water, strongly played upon with a naked gas flame, when the water boiled without any breakage resulting. Further: it was, with a cold pair of tongs, lifted off the stand and placed upon a cold piece of iron, again with perfect safety. We cannot avoid thinking that to photographers, whose chemical experience is usually of a restricted character, such vessels would be very useful aids.

We believe that not many photographers, of those who are in the habit of using cyanide for fixing, preserve their fixing baths to collect the silver from them; for such as do, however, we note a new method of reducing the silver. Sulphuric acid is added, which will throw it all down; the residue, after ignition, is treated with nitric acid, from which the silver may be thrown down again as chloride, and reduced in the usual manner.

Meetings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The usual meeting of this Society was held on Thursday, the 1st inst., —the Rev. F. F. Statham, M.A., President, in the chair.

Mr. W. L. Skeen was elected a member.

An address *On Educational Aids by Photographic Exhibits* was delivered by Mr. Thomas J. Pearsall, F.C.S.

Mr. Pearsall said he considered there was a great future in the applications of photography to educational purposes. He thought the correct representations of all objects would be of the utmost importance in training the faculties of the young, who were perplexed and confused by the numerous little streaks and lines which were the artist's means of portraying nature. The young could not distinguish the lines adopted for outlines and shading from the lines which were supposed also to represent texture. It was not merely the forms were incorrectly copied, but great waste of time to gain the proper ideas, while if subjects were represented by photography then their fidelity would be at once apparent. It was well known there were great difficulties in obtaining proper copies to teach drawing to pupils. Sometimes the conventional style of an artist has been preferred—a sort of fashion; but the young learner soon turns from the attempts to copy the touches of an artist that, after years of practice, can produce results to please the public; but the student can neither produce a pleasing effect nor any likeness of nature. In the case of blacklead pencil practice too frequently the copies are produced with lithographic inks and chalks. The fine details in the foreground may have the sharpness due to scraping out lights, and from a mere mass of blackness a needle point may scratch up fine lines or give catching lights and indications of detail which the pupil cannot possibly follow, and who produces after great labour a woolly or uncertain result, and leaves off quite disheartened. Now, if the student was taught true lines, the means to preserve lights and to produce shades, then copies produced by photography would give correct outlines, light and shade, and the numerous details of texture in nature to aid in correctly training the faculties of observation. Every means should be taken to give the young correct examples; and, as it is well known there are periods of fatigue when a change of pursuit is required, so, if the young could be interested and the teacher stimulated and rewarded, it would be conferring a great benefit. He thought photography might be introduced to give correct forms and indications of structure—not merely for drawing, but to assist in correctly observing. He had hopes some forms of the microscope might be introduced. A cheap glass and a prepared set of photographs would enable a vast number of truths to be known, recognised, and verified; and if a number of copies were prepared—say several hundred of the most ordinary objects and structures—the young would know what to seek and learn and admire. In this way the beauty of minute living forms, whether of insects or of flowers, would be sources of wonder and delight. The minute flowers, such as the mignonettes; the little plants, such as mosses and duck weed; the compound flowers of the daisy, the flowering states of grasses and corn plants, the pollen of flowers, the leaves of geraniums, &c., the starch granules of the potato, and ordinary salines, would yield great interest alike to teachers and students if they had plates of the objects they were to look for. A definite set of subjects could readily be made with such photographic guides and cheap magnifying glasses. Abundant interest would be afforded to teachers, who gladly turn to any means to carry on instruction at hours when the faculties are in a tired condition. This proposition, he thought, would commend itself if once it was fairly applied. Referring to the fine microscopic enlargements shown by Mr. Viles, and other subjects in the Photographic Exhibition, he thought the collection itself was a suggestive source of questions as to the education of photographers, amateurs, and the public. If the very fair question were asked when a photograph was to be seen—"How do you expect it will be shown?" few were, perhaps, prepared with an answer beyond their own practice. Here we may see photographs without any margin framed to the very edge of the subjects, while the next set would have wide margins and elaborated intervals and lines, forms, and colours between the photograph and the frame. Thus the view of the Philadelphia Exhibition was brought up to a gold moulding and then a wood frame. Mr. Payne Jennings had nine subjects, each brought close up to black separations in a black frame; the Royal Engineers had their subjects up to a flat gold mount and frame; Mr. England had white margins and gold. Some were on brown, pale fawn with edges of red-lead; others green, like morocco, with elaborate lines and toolings; in some cases the mounts were too brilliant, however pale the tint. In all such cases it would be of great importance if standards of colour could be agreed upon. Radde's *Scales of Colours* and the printings from hundreds of these tints by the stenochromy process were shown, and the words quoted of a reviewer—"that a practical set of tints might be formed to enable the printer and toner to regulate their work—in fact, a photographic actinometer." After giving commercial difficulties to describe and verify delicate tints, and the taste, skill, labour, and expense of preparing Bellows's French Dictionary, he (Mr. Pearsall) alluded to the confusion of colours and colour-blindness of the public. Five per cent. of the people were unable to distinguish colours, and five per cent. confusing or unable to describe them; hence he thought standards of tints and colours of great value. He also thought it would be interesting to know what principles were involved in displaying a photograph. If it were treated as a work of art or as a picture, then it might be framed to the edge of the subject; but if it were displayed by margins besides the tints or colours of the mounts, then arose the questions of the breadth of the margins; what breadth? Should the margins be equal or unequal all round? And whatever the breadth, should there be a greater space at the bottom than the top of the subject? He (Mr. Pearsall) concluded with the hope that the educational aspects of photography might be well considered in the future.

The Chairman said that at that late hour, with the number of questions and opinions involved in the paper, to be more conveniently discussed at future meetings, he would offer his remarks to confirm most fully the disadvantages of children having copies before them full of the technicalities of production, whether by the engraving or scraping implements. Undoubtedly the best copies were the sketches and drawings of the best artists, and every touch of the artist's pencil could now be reproduced by photography. The sketches of these great artists would thus be furnished to the public. In the reproductions —from the crayon sketches of M. Angelo, the designs of Raffaelle, the simple studies of heads by Holbein, to the blacklead pencil drawings by Harding, they had abundant sources of examples. In fact, on the subject of enlargements he saw it was possible to have subjects thus produced to be shown by daylight, and not to be dependent upon the transient and expensive means of the lime light. He thus saw a great field if the finest living models were selected for the benefit of art and the artists themselves. It was well known that artists had great difficulty in obtaining models, besides the expense and difficulties of the surroundings. The models were not always in good health, and became weary of the long-continued, strained position of the muscles. That was a subject the authorities at South Kensington might take up for the benefit of art and artists, and photographic enlargements might greatly advance education.

Mr. Meyerstein thought Mr. Pearsall had given too limited figures to the colour incapacity of people. It had been found in Sweden, after an accident by mistaking red for green, that of the staff of the company above forty per cent. were found to be defective in colour observations, and this was followed in Germany by examinations which showed above thirty per cent. of the people employed had colour defects. The German government were taking steps to remedy this state of affairs by making colour knowledge a branch of education.

The thanks of the meeting were given to Mr. Pearsall, and he was assured the questions that had been treated of in his communication *On Educational Aids by Photographic Exhibits* would not be lost sight of. The meeting was then adjourned.

BERLIN PHOTOGRAPHIC SOCIETY.

The first meeting for the season of this Society was held on the 21st Septemher, on which occasion, in the absence of Dr. Vogel and Herr Prümm, the chair was taken by Herr Hartmann.

After the admission of nine new members, a number of frames, by Herr Lindner, were laid upon the table, and a series of views in the Italian Alps, by Baron des Granges, were handed round and duly admired.

An instrument, patented by Herr Krüger, which was intended for the determination of the silver contents of a negative or positive bath, or, to speak more accurately, of a silver solution, was exhibited by Herr Reichard.

Herr Reichard affirmed that he had got very satisfactory results from the experimnnts he had made with the instrument; he had, however, the advantage of working with new baths, with whose percentage of silver he was perfectly acquainted. In order to see whether any free nitric acid that might happen to be in the solution would not attack the copper, he had left a piece of the latter a whole night in a mixture of one part of nitric acid to ten parts of water without being able to detect the smallest loss of weight on the part of the metal. At all events, he thought the instrument was a great advance upon the ordinary test with the areometer (argentometer), which is quite untrustworthy in the case of baths that have been used.

Herr **Schaarwächter** thought the instrument very ingenious, but doubted whether it would be very widely employed. The tests furnished by the areometer were, he admitted, not very correct, yet he believed them to be sufficiently so for ordinary photographic purposes. If there were, however, any question of a correct test he thought Vogel's method surer and quicker.

Herr **Quidde** agreed with the last speaker, but thought with Herr Reichard that the new instrument was sufficiently exact for photographic purposes. A chemist would, however, scarcely recognise it as an accurate test. A determination by weight which was calculated from the turn of the tongue of a balance was not precise enough, as, in order to be trustworthy, the balance would require a certain predetermined weight to bring the indicator to zero, and this they could not have in the present case, as the piece of copper used for that purpose would always be becoming lighter. He also doubted whether, at the price named (about six shillings), the scale could be properly tested; by which he meant that opposite each separate stroke upon the scale indicating a decigramme a weight ought to be placed which should differ from the preceding as did the loss of weight of the copper from one decigramme of silver deposit. Also it did not seem to him that it was very easy to read off the weight indicated, the indicator being placed at too great a distance from the scale. That fault, however, could be easily remedied. But even supposing that in that way the loss of weight could be exactly determined, he did not know that the test would be sufficient, as it might happen that some of the silver precipitate might adhere to the copper, or that some of the copper might be scraped off with the silver—either of which accidents would affect the result. That the free nitric acid contained in the silver solution would not affect the copper he (Herr Quidde) could readily believe; but he thought it questionable whether it would not do so along with the acid set free from the lunar caustic. That it was not altogether inactive was proved by the precipitating process proceeding rather more rapidly in its presence.

Herr **Roloff** said Herr Krüger had discovered a salt which prevented the blistering of albumenised paper, and which he called "*glättesalz*," or "smoothing salt." He (Herr Roloff) had tried it on some very blistery paper with the effect of getting a paper quite free from blisters. The "smoothing salt" required to be used in concentrated solution.

Herr **Reichard** had also tried it with satisfactory results, though he did not feel sure that its use might not be accompanied by some as yet unforeseen drawbacks.

Dr. Wolfram, who had accompanied the transit of Venus expedition to Auckland, sent a collection of dry-plate landscapes of Auckland scenery, which yielded nothing in beauty to wet plates. These were laid on the table along with some pictures by Herr Obernetter, in what he calls "colour-lichtdruck."

The **Chairman** took the opportunity of correcting a mistaken notion which seemed to have taken possession of the public mind, viz., that a real method of photography in natural colours had been discovered.

Herr **Quidde** asked whether any one had tried and could report upon Herr Krüger's new fixing salt.

Herr **Halwas** remarked that he had tried it with the unsatisfactory result of the pictures remaining unfixed.

Her Kuntze showed a number of portraits coloured by Herr Hertel, of Potsdam, after which the meeting was adjourned.

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Correspondence.

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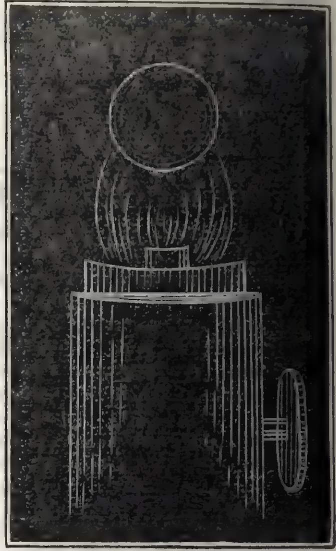
"KEEVIL'S PATENT NEWTONIAN LANTERN."

To the Editors.

Gentlemen,—I am sorry to be obliged to dispel Mr. Keevil's claim to the invention described by you under the above name. But, as you will see from the catalogue of the Great Exhibition of 1851, I exhibited a very much more perfect form of the same lantern, with either two or, as I always used it, with three nozzles and one light. I send you by book post Hunt's *Handbook* of the exhibition, where you will find a full account of it. I cannot lay my hand on the catalogue itself. I believe it contains a drawing of the perfect instrument; but I enclose Messrs. Abraham's first advertisement and drawing, which is headed "Beechey's Patent Dioptric and Trinoptric Lantern."

The latest improvements were contained in the instrument I sent to the exhibition. It was circular. The front nozzle was fixed as in a common lantern, but the two side nozzles moved in a circular groove through an angle of 15° each, with leather bellows curtains between them and the front. Of course the light was central, and so always equidistant from all three condensers at whatever angle they stood to one another.

Another improvement, which Mr. Keevil would do well to adopt, consisted in the peculiar prisms which I calculated, and had made in Paris. They were ground at an angle of 80° instead of 90°, by which *alone* can a *perfect* reflection of the entire disc be obtained. Silvering the back of the prism will greatly obviate the defect; but when the incident ray impinges on the back of a prism at any less angle than 41° 50′, the reflection from an *unsilvered* back will be theoretically *perfect*, for not a single ray can pass through the glass. This is accomplished by making the prism with the front angle = 80°, and, of course, the other two of 50° each instead of 45°. My prisms, also, were either plane or lenticular. I can bring you a pair of both forms, and in addition I had, and still use, the most perfect dissolving shutters ever made (one of which I will take you when I come to town), by which the entire disc is gradually brightened from a pinhole aperture to the full lens.



As regards the light: you will find a full description of my own special oxy-oil lamp in Messrs. Abraham and Co.'s advertisement. It was indeed this invention which gave rise to the trinoptic lantern, because the light is a small circular flame, equally bright on every side. A small Argand burner, fed from a fountain with olive oil, had a copper tube of about one-eighth of an inch in the centre, through which a jet of oxygen gas, at low pressure, came, causing intense brightness; whilst a ball of lime, about five-eighths of an inch in diameter, was suspended by platinum wire above it, and added greatly to its intensity.

Mr. Keevil, in vain, tries to remedy the imperfect illumination of his two condensers by moving the ordinary oxyhydrogen light from the centre of one disc to the centre of the other. Both discs can never be properly illuminated *together*, whilst three of mine enjoyed perfect illumination at once. In fact, the great perfection of the trinoptric lantern consisted in its capability of having three perfect pictures either side by side or as dioramic effects on the same disc.

You are quite at liberty to transcribe the capabilities of the Beechey lantern, as set forth in Messrs. Abraham and Co.'s advertisement, if you think proper, or to show the paper to Mr. Keevil or any other person.—I am, yours, &c., St. Vincent Beechey.

Hilgay Rectory, October 30, 1877.

[We hope, after a careful examination of Mr. Keevil's lantern, to be in a position to offer some observations of a practical character respecting it in our next. In the meantime, we are of opinion that there are well-marked distinctive features between it and the equally-ingenious one described by Canon Beechey.—Eds.]

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SIR THOMAS PARKYNS' COLOURED PHOTOGRAPHS.

To the Editors.

Gentlemen,—I have read the article in your last issue on my new process for colouring photographs with great interest—I may say pleasure, seeing that it conveys to me two ideas:—First, that it may be of use; second, that my weak rod may form one in the great bundle which will eventually prove a lever strong enough to raise our art-science to the height of excellence.

I am no artist in the meaning of the word as accepted by some—that is to say, I cannot paint. The nearest approach to it which I can do is to colour my prints. You have proposed several ingenious suggestions as to the way in which this may be accomplished. Some of them I have tried and have not been satisfied, as I find the results uncertain. For silver prints and very light shades doubtless tinted papers answer well, if they will not fade or change; but I have not found it so when employing the autotype processes.

Two negatives make a positive, but two wrongs do not make a right, and one destroys it; so, though you have proposed excellent plans for arriving at some results, your arrows have fallen wide of my target. In not one of the examples you have seen has an aniline dye been used. I object to it because it produces, however managed, an appearance somewhat similar to that represented by the prints on bonbon boxes. One of the advantages of my process, I think, you will allow is that there is nothing of this transparent glaze. Another quality is its extreme simplicity; and, again, its cheapness. I believe it to be as everlasting as the foundation to which the prints may be transferred; and seeing that I intend to use *(personally)* no colour which cannot be recommended as perfectly permanent, they ought to last longer than even oil paintings, in which it is well known many pigments are employed which are very much the contrary.

Doubtless there are ways and means by which varied tints could be given to the same print, but I have been tied by the rule of the Photographic Society of Great Britain declaring that any coloured prints would be refused admission to the Exhibition. I therefore communicated with Mr. Baden Pritchard, explaining to him that mine would not be *painted*, and sent him a small sample, to which he answered that they would be clearly admissible.

If I am permitted by the patent laws at the present stage of the proceedings I shall be happy to explain at once how my results have been obtained. "Notice to proceed" has been given, but the "sealing" has not yet taken place, and will not, in the ordinary course, for some weeks. I will only add that, as regards those examples which you have seen and others by the same process, any shade of any colour can be produced with the utmost certainty and ease of manipulation by a practised hand.—I am, yours &c., THOMAS PARKYNS.

Harnham Cliff, Salisbury, November 5, 1877.

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EMULSIONS.

To the EDITORS.

GENTLEMEN,—It would be very desirable if, at stated intervals, we might stop and report progress in those branches of photography which are at present in a tentative stage. I allude more particularly to washed emulsions.

Every week your columns teem with suggestions and experiments —some of the greatest utility, others of little value, but all showing the interest taken by your readers in the progress of the art. It would be a great advantage to many to have (say) every three months a *résumé* of all that has been tried and suggested, with, as far as practicable, the result of an independent examination of the value of such experiments or suggestions.

In my own way, as an amateur and tyro—if you excuse the egoism—I endeavour to work out every suggestion that appears, if of advantage in connection with the work in which I am at the time engaged. For instance: I find powdery gun-cotton recommended for washed emulsion, and I use it. But you advise horny cotton, so I try that. M. Chardon advises precipitated cotton, and I precipitate it accordingly. I use the proper proportions of solvents. I wash with care. One time I add albumen, another I add potass, another I add sulphuric acid, as I am variously advised and directed, and still I don't succeed as I could wish. However I may vary the ingredients I get pretty much the same thing —a delicate, sensitive emulsion *without density;* and I want to know why it is. I seem to be working altogether in the dark.

What, for instance, is the effect of adding the organifier to the emulsion before washing, and what after? And whence does the great difference arise that appears in the picture if the coated plate be soaked in the organifier before drying? Of all the substances infallibly recommended for securing density will any one in practice ensure it? If I dip a plate in the silver bath, expose, and pour iron on it, in a few seconds I get a picture. If I coat a plate with an emulsion I am not regularly using it is alogether a lottery whether it developes or fogs. In fact, alkaline development is a life's study in itself; a single plate may take hours to develope it properly.

I am inclined to agree with Dr. Nicol as to the future of gelatine; but I find it inferior to collodion in sharpness and roundness of the image, so that for portrait work I have found it unsuitable. For landscape work there is great want of contrast in the shadows; when printed there is no detail to speak of in the shade, although the negative, when looked at, is full of detail. Whether there be any gain in using an organifier or not it undoubtedly assists in keeping the film bright and free from fog. With regard to frilling: I find the addition of fifteen or twenty per cent. of pure alcohol, when dissolving the washed emulsion, so far a perfect cure.

With regard to collodion emulsion: the difficulty is to get the right sort of cotton. In my experience the fifty perfect cures in the shape of organifiers added to the emulsion before or after or during washing, or added to wash before developing, or added to the developer itself, have the slightest possible, if any, effect on the density of the plate. If, with the cotton and the formula I use, the resultant image be feeble and delicate, not one of all the infallible nostrums called "organifiers" will ever make it dense.

Now I suppose you know all this, but you sit laughing in your sleeves at poor devils who, believing all they read in the Journal, are trying all these recipes which you know well enough are useless. When a gentleman writes, for the benefit of poor amateurs, that dry plates won't show detail on the shadows, and require twenty times the exposure of wet ones, why cannot you, in a footnote, quietly explain that the man is a lunatic.—I am, yours, &c., W. MAXWELL JACKSON.

November 3, 1877.

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RAPID EMULSION.

To the EDITORS.

GENTLEMEN,—Would you kindly allow me to ask Mr. Inskipp if he would have any objection to favour his fellow-workers with the formula for the emulsion by which he has obtained the extraordinary rapidity mentioned in your "Answers to Correspondents" last week, viz., less than half-a-second *with an aperture* $\frac{f}{22}$.—I am, yours, &c.,

1, *Chesnut-terrace, Iffley-road, Oxford,* JOHN VAUGHAN.
October 30, 1877.

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SOUTH LONDON PHOTOGRAPHIC SOCIETY'S FORTHCOMING TECHNICAL EXHIBITION.

To the EDITORS.

GENTLEMEN,—Kindly permit me to announce that our Technical Exhibition Meeting will take place on Thursday next, the 15th inst., at seven o'clock (admission free), at the House of the Society of Arts, Adelphi. Also that the annual dinner of the Society (open to friends who desire to be present) will be held on Saturday evening, the 17th inst., at Anderton's Hotel, Fleet-street. Particulars concerning the Technical Exhibition, and tickets for the dinner, may be obtained from me.—I am, yours, &c., EDWIN COCKING.
Hon. Sec.

57, *Queen's-road, Peckham, S.E.,*
November 7, 1877.

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PINHOLES.

To the EDITORS.

GENTLEMEN,—Allow me also to have my little say about spots. The photographic world is being tortured about that diminutive article, and so, as I feel sure of being able to help its sufferers out of their difficulty, I venture to write a few lines on that most vital subject. After having read with interest the exemplary epistles, in which the authors freely express their wonderful contempt of each others' opinion, I thought that I, too—who keep as much as possible out of petty squabbles—would set forth my thoughts before the brotherhood, knowing well, from former experience, that it will not be undervalued by them.

Spots! What an evil word it is! bringing discomfort and all the vexation that a mortal mind can be capable of feeling. From the days of the silver bath, which I consider are now numbered, to the emulsion plates of the present time, the word "spots" has burst from the quivering lips of every photographer. Half the failures have and do come from them; but still their nature and habits are unknown, though innumerable scientific investigators have searched untiringly through the mysterious *films* that envelope and hide them.

Mr. William Brooks has endeavoured to elucidate the causes of the evil, but they are still somewhat dark and difficult to avoid. He has told us of what to beware. He has hinted to us not to waste our silver nitrate when we grind it, because it's dust, flying about, would probably fix itself to the films when we coated our plates. Also, the acids and hypo. he tells us to keep away from our dark rooms, so that they shall not contaminate the air, for spots will be the result. But, even after following all these injunctions, our subtle enemies still appear. Oh, poor brotherhood! why are our members so benighted.

Many and many a time the hand of some scientific investigator has been held out to photographers, but they have not grasped it, and are still woefully groping in the dark. But, *ecce;* from another source comes the word—it whispers "*carelessness.*" Let me say something about what I have found, and I shall be short; for already I see the editorial scissors looming up threateningly before me.

First, then, as to the very small opaque black spots generally found in the blacks of the negatives. Well, I have got rid of them by shaking well the bottle containing the emulsion, and though this seems contrary to what others tell us, still it is so with me.

Secondly: a large transparent spot with a nucleus in the centre, which is generally a particle of dust in the shape of a hair about the one-twentieth of an inch in length. These spots are not observed until the hypo. dissolves away the unaltered bromide. The nucleus seemed to keep the developer from acting round it, and so, of course, the hypo. dissolves the bromide there.

What that nucleus is I do not know, but I think it is something in the emulsion which attracts the dust just at that point. Perhaps it is a particle of the resin or gum used as a preservative. I am inclined to take this solution of the matter, for I find that when the emulsion *is* old the plates are freer from them, because the gum has become better incorporated with the other contents of the emulsion. I have always dried my plates artificially—indeed, I do not know what I should do if this was not the case when on a tour and away from my dark room at home. I place a piece of sheet iron, the size of the plate, over a spirit lamp, and after waiting until the whole batch of glasses are coated I begin from the first and dry them over the iron plate, taking care to keep them about a couple of inches above it.

In working the very rapid emulsion with excess of silver I have often got a splendid collection of pinholes, perfectly riddling the blacks of the negatives. I could not make out the cause—perhaps carelessness again. But I must turn to another subject.

After trying all manner of devices to stop this quarrelling, quibbling, and bad feeling between writers, an editorial mandate comes forth, in which it is laconically specified that writers are to give their names for publication, and lo! on the instant the trouble vanishes—happy thought.—I am, yours, &c., A NEAPOLITAN PHOTOGRAPHER.

Naples, November 1, 1877.

EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale*, that being done at a small cost in our advertising pages. This portion of our columns is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

A No. 2B patent *carte-de-visite* lens, and 10×8 wide angle landscape lens in exchange for a No. 2A patent portrait lens, or No. 3B cabinet (patent.)—Address, Joseph Simpson, Snayd-street, Tunstall.

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ANSWERS TO CORRESPONDENTS.

Photographs Registered—

J. Henderson, Charing Cross.—*Portrait of Miss Frier.*

George M'Kenzie, Paisley.—*Portrait of the Rev. James Scott.*

☞ *Correspondents should never write on both sides of the paper.*

Notice.—Each correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a *nom de plume* as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications.

M. H. (New Zealand).—Post-office order received. Thanks.

Rap. Rec.—We do not reply to queries put by anonymous correspondents.

George Hercus.—The scheme may possibly prove remunerative, but it certainly has not our approval.

T. B. B.—Diminish the proportion of citric acid, and increase in a proportionate ratio that of the acetic acid.

S. M. T.—The cheapest and best material with which to construct the tent is black calico for an outside covering, and deep yellow calico for the inside.

D. H. W.—The pinholes in your case are obviously caused by your making use of a bath well stocked with particles of dirt capable of being removed by filtration.

A Young Reader.—For painting the skies of transparencies for the magic lantern, Prussian blue is considered to be best; certainly it is most used for the purpose.

Joseph Peach (Huddersfield.)—Received. The picture should have been forwarded to the editorial department. That has now been done. The business matters have received attention.

Sidereal.—Remove the whole side of the roof, and have it glazed to within three feet of each end. Do not trust to your own architectural skill, but employ a properly-qualified professional.

Inquirer.—We are not in a position to offer any opinion upon the merits of M. Scotellari's *cap* from the patent point of view, seeing we are yet in ignorance of the nature of his patent claims.

Cadmium.—The alkaline developer should not become discoloured to the extent and with the rapidity mentioned. We should prefer to employ an acid to an alkaline developer in the production of pictures on opal glass.

A Junior Partner.—There is no necessity for your paying two guineas for the alleged secret process, as it can be obtained by an expenditure of one shilling for The British Journal Photographic Almanac.

W. I. K. A.—The cost of a conservatory such as you describe, which will also answer as a photographic studio, would be from thirty to forty pounds. This, at any rate, is the information we have received from a practical man.

B. O. T.—Apply a little powdered rosin to the surface of the varnished negative, using the point of the finger as a rubber. To colour the grass in the transparency use a mixture of Prussian blue and burnt sienna. Raw sienna is the most suitable colour for a gravel walk.

F.R.S.—By rubbing briskly over the surface of the negative a little finely-powdered French chalk all danger of its adhering to the paper will be obviated. A pledget of cotton wool may be employed as a rubber. Your other question cannot be answered in this page.

G. P. (Jersey).—The description of York's camera with a finder will be found at page 71 of our volume for 1873. The title of the article is *York's Zoological Camera.* Cases for binding the volumes of this Journal may be obtained on application at the publishing office.

W. J. S. (Birmingham) inquires—"What strength of solution is required of the bichloride of mercury for making the magic photographs?"——Reply: make a saturated solution of bichloride of mercury in hydrochloric acid, and dilute this with eight or nine parts of water.

J. G. Kealb.—The goodwill of such a business as you describe is not worth anything at all. Nay, we are rather of opinion that it would be worth *less* than nothing; and that it would be a considerable time before an honest and energetic photographer would overcome the evil influences which seem to have become attached to the business.

J. P. R.—Inasmuch as the patent has expired you may regard the letter as a mere idle threat. Give your correspondent a quiet hint that upon the receipt of another such letter you will raise an action against him for an attempt to extort money or to obtain it by false representations, and you may depend upon it that you will never again be troubled in a similar manner.

Eildon.—The following general rule will suffice:—The deeper the curves of the meniscus lenses are the smaller must be the aperture in the diaphragm.

C. (Liverpool).—Apply to the crack a very thin solution of Canadian balsam in turpentine, using a camel's-hair brush for the purpose. Then apply a thick coating of Canadian balsam to the whole of the back, and, by this, cement on to the negative a plate of glass of the same size. Take care that no air-bubbles are imprisoned when bringing the plates into contact.

Smafratomha.—1. The suggested burnisher will prove excellent; it differs from any that we have seen.—2. To make *aqua regia* mix two parts of hydrochloric acid with one part of nitric acid.—3. Yes; you have now got entirely rid of the "hardness" of which we complained. The enclosed print is, at any rate, very soft and harmonious.—4. We are not familiar with the construction or employment of stoves for the purpose mentioned.

C. Brindley Beddoe inquires "whether a Howard's tent would hold a half-plate bath and dark slide, and also leave room for developing a plate the above size? All the developing (he says) I should want to do would be to develope with iron and flow with a mixture of acetic acid and water, leaving intensifying and fixing for a future period, and also dispensing with water."——In reply: a Howard's tent will answer quite well for the purpose in question.

Theodore.—It is useless trying to effect the dissolution of the commercial vulcanised india-rubber in benzole. If "bottle rubber" be obtained, and the outside be pared away, it is probable that a solution will be made with ease. White rubber is preferable to any other kind. A very good method, which we can recommend, consists in diluting rubber paste with benzole. The paste can be procured at all the india-rubber warehouses at a cost of a few pence per box.

H. H. (Leeds).—To print by development, salt the paper in a solution composed of eight grains of chloride of ammonium and eight grains of citrate of soda to the ounce of water. To this add a little boiled arrowroot and sufficient citric acid to make it slightly acid. The paper is excited by being floated upon a twenty-five-grain silver bath for half-a-minute. This bath ought to be slightly acid, citric acid being employed for the purpose. Develope with gallic acid and acetate of lead.

G. R. Rogers.—By removing the lenses and immersing the mounting for a few minutes in a boiling solution of washing soda the whole of the lacquer will be removed. Now give it a good brushing with a mixture of tripoli powder and oil, by which the surface of the metal will become quite bright. After this it must be relacquered. If you have access to a turning lathe make use of it in imparting the final polish and lacquering to the mount, as it is impossible otherwise to make an elegant job of it.

R. A. R. says:—"Some few weeks since I made an excursion to one of our cathedrals for the purpose of taking photographs. Before starting I prepared a sufficient number of Liverpool emulsion plates, and these I packed in parcels with india-rubber bands at the end of each alternate plate, and placed them face to face and back to back. When I returned home I proceeded to develope them, when they came out as follows:—The ends of the plates, and also large spots about the centre, when looked through, appeared transparent, but showed a foggy-looking picture by reflected light. The other portions of the plate were all right. Previous to starting I exposed and developed one or two of the plates to test them, and there was nothing the matter with them. Can you, or any of your correspondents, tell me how I can save the remainder of the plates (I have developed twelve out of fifty-four taken), or render them passably good. By so doing you will greatly oblige."——Has any reader had experience in this direction?

⁂ We are reluctantly compelled to leave over till next week the conclusion of Mr. A. Bowman's paper read at the last meeting of the Glasgow Photographic Association, and also No. XI. of Mr. J. Wake's series of articles on *The Art of Painting on the Photographic Image.*

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Photographic Society of Great Britain.—A meeting of this Society will be held on Tuesday next, the 13th inst., at the Photographic Exhibition, 5, Pall Mall East, at 8 p.m. On this occasion, the medals awarded by the jurors will be presented. The above is the last evening upon which the Exhibition will be open to members, each of whom has the privilege of introducing a friend. The Exhibition closes definitely on the 15th inst.

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METEOROLOGICAL REPORT.

Observations taken at 406, Strand, by J. H. Steward, Optician

For the Week ending November 7, 1877.

These Observations are Taken at 8.30 a.m.

Nov.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks
1	30.40	W	45	48	57	44	Fine
2	30·23	SE	46	48	54	42	Foggy
3	30·06	NW	45	49	55	45	Fine
5	29·79	W	49	51	60	44	Cloudy
6	29·73	SW	54	55	59	49	Raining
7	29·64	SW	56	57	59	53	Cloudy

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 915. Vol. XXIV.—NOVEMBER 16, 1877.

OUR FORTHCOMING ALMANAC.

The Editor, while acknowledging the rich stores of knowledge so liberally placed at his disposal in previous years by his friends and photographers generally, believes that this information, so far from being exhausted, is ever accumulating. Knowing the value, to those who practice our art-science, of the selections and jottings annually presented in the pages of the Almanac, and with a view of rendering the forthcoming publication as useful as its predecessors, he appeals to all photographic workers and thinkers to contribute their quota to this annual compendium of photographic progress. Descriptions of new processes, "dodges," hints, methods of encountering difficulties, or remarks on the æsthetics, philosophical phases, practice or commerce of photography, by the presentation of which the art is likely to be advanced, will prove acceptable to the Editor, and, he doubts not, equally so to the readers of The British Journal Photographic Almanac for 1878.

It may here be repeated that as an advertising medium it is without a rival; and, being retained as a standard work of reference in photographic matters, advertisers will find their announcements more permanent than in the case of serial publications, while it is also true that the Almanac finds its way into many studios and on to the library tables of amateurs where the usual weekly journals may fail to gain regular recognition. For these reasons it is recommended to the notice of advertisers as the most valuable medium for popularising their various business announcements. Terms and other information may be obtained at the Publishing Office, 2, York-street, Covent Garden, W.C., or from the advertising columns of this Journal. Early application is absolutely necessary in order to secure precedence.

ON THE ACTION OF CAUSTIC ALKALIES ON THE BROMIDES IN EMULSION.

In connection with the subject of alkaline emulsions, treated in our last week's number, we may call attention to a very important point which we have not previously mentioned, but which exercises a most decided influence upon the result; it may, indeed, be said to possess special properties which give it a distinct bearing in an entirely different direction. We have occasionally noticed a great disparity in the effects produced by the addition of apparently similar doses of alkali to different emulsions, and, failing any other explanation, we were inclined to attribute the difference to the common cause, "some peculiarity in the pyroxyline." But, finding the same disparity to exist in the action upon two samples of collodion which we knew to be made from the same cotton, we were compelled to reject our first idea; and, our attention being thus drawn to the matter, we were enabled with little trouble to discover the true cause of the uncertainty, which proved to owe its origin to the employment of different bromides in the collodion.

In point of fact, we find that a collodion bromised with cadmium or zinc, either wholly or in part, produces upon sensitising with ammonio-nitrate an emulsion differing greatly in appearance from one in which ammonium bromide alone had been used, and also that the ultimate effect of the alkali in the two cases is widely different. We mention only the three bromides most generally in use, but, no doubt, others will be found to exhibit the same variable results. Nor is the effect thus produced confined to ammonia; we have noted it when using potash, and have reason for believing that it occurs whatever form of alkali may be employed. The explanation is very simple. The soluble salts of zinc and cadmium give with caustic alkalies precipitates consisting of the hydrated oxide of the metal, a double decomposition occurring between the alkali and the bromide in the collodion, in which the former displaces the metal in combination. Thus, let us suppose a collodion bromised with cadmium to be sensitised with ammonio-nitrate of silver. A double set of reactions occur; for, in addition to the combination between the silver and the bromine, the free ammonia liberated by the decomposition of the ammonio-nitrate is seized upon by the nitric acid, which would otherwise enter into combination with the cadmium, the last being left in the state of oxide. If, for clearness' sake, we suppose the ammonia to be added separately, the following formula will express the reaction :—

$$\overbrace{2\,Ag\,NO_3}^{\substack{\text{2 equiv.}\\ \text{Silver}\\ \text{Nitrate.}}} + \overbrace{2\,NH_4\,O}^{\substack{\text{2 equiv.}\\ \text{Ammonia.}}} + \overbrace{Cd\,Br_2}^{\substack{\text{1 equiv.}\\ \text{Bromide}\\ \text{Cadmium.}}} = \overbrace{2\,Ag\,Br}^{\substack{\text{2 equiv.}\\ \text{Silver}\\ \text{Bromide.}}} + \overbrace{2\,NH_4\,NO_3}^{\substack{\text{2 equiv.}\\ \text{Ammonium}\\ \text{Nitrate.}}} + \overbrace{Cd\,O.}^{\substack{\text{1 equiv.}\\ \text{Cadmium}\\ \text{Oxide.}}}$$

The effect of these changes upon the character of the resulting emulsion will be obvious. In the first place, as it affects the proportion of free alkali: the ammonia is replaced by the insoluble oxide of cadmium, which, though equivalent to it as far as regards its capability of combining with or neutralising acids, is not an alkali, and therefore exerts none of the influence upon the emulsion which would ensue from the presence of free ammonia. Thus we see that it depends entirely upon the relative proportions of the bromide of cadmium (or zinc) in the collodion and of alkali added whether there be an ultimate excess of the latter. But, if bromide of ammonium alone be contained in the collodion, every atom of alkali afterwards added will remain ultimately in the free state, and capable of exerting its specific action upon the emulsion. We have endeavoured to place as clearly as possible before our readers the important bearing that the nature of the salting of the collodion has upon the ultimate alkalinity of the emulsion, and we shall now turn to another phase of the question more directly affecting its physical character.

On more than one occasion we have made allusion to the peculiar richness of colour exhibited as a rule by emulsions sensitised with ammonio-nitrate of silver, or with the addition of an alkali. This we had attributed to some special action of the ammonia or other alkali upon the formation of the silver bromide, which appeared to be formed (if the colour test be of any value) in a much finer state of division than under ordinary circumstances. Our recent investigations, however, have proved to us that much, if not all, of the extraordinary richness of colour is due, not to the specific action of the alkali in the manner we had supposed, but to the formation, simultaneously with the silver bromide, of the oxide of cadmium. The latter substance emulsifies even more perfectly than silver bromide; and, as its colour by transmitted light is very similar, if not identical, it may be readily imagined that the effect produced is easily mistaken for a change in the state of the bromide.

In order to exhibit this action to its fullest extent take a small quantity (say one ounce) of plain collodion, and add to it eight or nine grains of bromide of cadmium. When dissolved add, drop by drop, strong liquor ammonia and observe the effect. The first two or three drops produce instantaneously a copious precipitate of a yellowish-white colour, which, when shaken up, emulsifies so completely as to be quite indistinguishable from an emulsion of silver bromide. Indeed, the only feature existing by which the two can be recognised is the depth of colour by transmitted light exhibited by the cadmium emulsion immediately after its formation; for, whereas the full density of the silver bromide is not attained until several hours, or perhaps days, after sensitising, the cadmium oxide reaches that stage within a few minutes.

The exact quantity of ammonia necessary to displace the cadmium in the previous experiment cannot be stated with any certainty, owing to the variable nature of the liquor ammonia of commerce; but probably five or six minims of the strongest preparation should suffice. We have, however, added considerably more than that quantity without exhausting the precipitating power of the collodion, though it smelt strongly of free ammonia, which would lead us to suppose that it is possible for the ammonia to remain uncombined for a considerable time even in the presence of undecomposed cadmium bromide. Another feature to be taken into account is the fact that the presence of organic matter interferes with the action of alkali upon solutions of cadmic and zinc salts; and hence it is possible that a more complex reaction than the one we have described may occur.

We have entered thus minutely into this matter in order to show how great an amount of uncertainty may arise in any experiments with alkaline emulsions, unless due regard be paid to the salting formula of the collodion. From what we have said, it will indeed be seen that it is quite possible to add a considerable quantity of alkali to an emulsion without its passing into the alkaline state; and, moreover, it is possible to secure the presence of free ammonia at the moment of sensitising, without its being retained in the free state, to act injuriously upon the collodion.

This leads us to an experiment we have made with a view of testing the possibility of the addition of ammonia to an emulsion sensitised in the ordinary manner; that is to say, without the employment of any restraining substance, as suggested in our article last week. With this view we took two ounces of collodion salted with double bromide of cadmium and ammonium ten grains, and sensitised by the addition of fourteen and a-half grains of silver to the ounce. Immediately after adding the silver the emulsion was well shaken, and four drops of strong liquor ammonia added. The immediate effect of this was to produce an emulsion which, to all appearances, had been sensitised several hours. At this stage not the faintest odour of ammonia could be detected through the smell of ether, though to test-paper the emulsion showed signs of alkalinity. It was set aside for twelve hours to ripen, at the end of which period all signs of alkali had disappeared, and the emulsion had assumed an extraordinary density without, however, any evidence of granularity or other injurious action of the ammonia.

A plate was coated, washed, and treated with an organifier of coffee, dried, and exposed. The resulting negative was clean and bright, exhibiting no special features to mark it as differing in preparation from an ordinary emulsion plate. The development was rapid and density easily obtained, though much of it was lost in the operation of fixing. The remainder of the emulsion was precipitated, washed, and re-emulsified. The second emulsion struck us at once as being sensibly less dense than it was previously, though it possessed greater body than one prepared without ammonia. Plates prepared with this emulsion exhibit a great peculiarity in development. Upon the application of pyro. alone a beautiful creamy-brown image of great delicacy is rapidly formed, which gradually acquires *detail*, but no *density;* the addition of ammonia and bromide at the proper time produces the latter. But if the complete developer of pyro., ammonia, and bromide, or the first two alone be applied in the first instance, a feeble, ghostly impression of the high lights only of the picture is obtained, and any attempt to force the operation results in hopeless fog. One half of an exposed plate, after moistening with alcohol, and washing, was treated with pyro. alone until the image was well out. Ammonia and a trace of bromide were then added, and the developer flooded over the whole surface. The portion previously treated with pyro. rapidly gained density, while the remaining half showed merely a foggy trace of the better-lighted portions of the picture. The contrast between the two halves was so great as to suggest the idea that one had received five or six times the exposure of the other; yet the difference was not due to an acceleration of the one half, but to the almost total destruction of sensitiveness, or rather developing power, of the other.

We are unable in any way to account for this eccentric action, but merely record it for the benefit of those of our readers whom it may interest. As in the case of the unwashed emulsion the image intensified readily, but the density was considerably reduced in fixing. The latter effect is no doubt due to the presence of the oxide of cadmium in the film, which, previous to fixation, by rendering the film more opaque, lends to the image an appearance of greater density than it really possesses, the real character of the deposit becoming apparent only after the removal of the oxide of cadmium and unreduced bromide by the fixing solution.

A question suggests itself as to how far it may be possible for us to avail ourselves of the presence of oxide of cadmium or of zinc produced in the manner described, as a preventive against blurring by reflection from the back surface. Stained films have been suggested for this purpose, but of the various colouring matters which have been tried none seem to be without objections of some sort, the great complaint being the injurious action they exercise upon the sensitiveness. In this latter respect it seems to us that the oxide of cadmium is not blameable; and if it should prove that the deceptive nature of the image before fixing is the most serious objection, we see no reason why that should not be surmounted. The addition to the opacity of the film produced by the presence of a full quantity of cadmic oxide is very considerable, and the removal of that substance from the film when it has performed its part is a matter of the greatest ease. Besides being soluble in dilute acids it is also dissolved by ammonia and hyposulphite of soda, so that its use for the purpose named does not even entail a separate operation, however simple, in getting rid of the oxide.

COLD IN PHOTOGRAPHIC OPERATIONS.

ALREADY we have our first touch of really cold and winter-like weather, so that our remarks may not be considered unseasonable on a topic of especial interest to our readers. We wish to dwell more particularly upon cold in the dark room and laboratory rather than in the studio, though we are not at all sure that the state of the thermometer in the reception room and the studio of a professional portrait photographer has not as important and lasting an effect, pecuniarily considered at any rate, as any amount of attention devoted to chemicals. An American photographer once replied with some amount of rudeness to a lady, who was complaining how uncomfortable, &c., she felt, thus—"We do not photogarph feelings here, marm." It may, perhaps, have been considered a "smart" reply, but we feel assured that expression is influenced to a most considerable extent by the state of the "patient's" feelings; and, as a long exposure is by no means conducive to the production of the pleasantest feelings, it will not be time thrown away if we devote some space to the consideration of the best means of facilitating operations in the dark room and printer's department.

Attention has often been called to the fact that chloride of silver is far less soluble in cold than in warm solution of hyposulphite of soda; and, though no evil may be anticipated from using the solution of the usual strength in accustomed operations, the fact remains that more time is required, for instance, to fix a print when the temperature of the solution is low than would be needed under ordinary circumstances. And it is under such contingencies—cold solutions, cold atmosphere, and general chilliness of working—

that assistants, unless with a fine moral sense, are apt to hurry rather than linger over their work, as chemical requirements really would indicate. Hence, during all cold weather it may be taken as a standard rule that the fixing solution should be of a slightly increased strength.

It is a common practice to keep the hypo. ready dissolved in a large jar, testing its strength by the argentometer, a certain number of grains, registered by that instrument, being taken to represent a certain amount of hyposulphite in solution according to experiments previously made. We have not at hand any table of such strengths to refer to, but from a table of solubilities and specific gravities such a table could easily be constructed. When, however, the method of dissolving the hypo. daily, according to the extent of the day's production of prints, is adopted, no special precaution as to extra strength of solution need be taken; for the dissolution of the hypo. ought always to take place by the aid of heat, neither is extra strength required if hot water be added to the extemporised solution, in a concentrated form, on account of the admixture of this salt with water being productive of such a large amount of cold that, even in summer weather, the temperature of the fixing bath freshly prepared without heat approximates to the freezing point more closely than is desirable or advisable. One precaution may be named, which may, in some cases, be needful to give—that is, where Mr. Spiller's recommendation to add carbonate of ammonia to the fixing bath—which, not very long ago, was again revived—is carried out. The hot water should not be poured on to the ammonia, but should be added after it is dissolved; otherwise decomposition would take place and its properties be altered, though not in the sense of preventing its solvent action upon the deposit in the whites.

The action of cold upon the collodion may be dismissed in a few words; for the cold produced by its evaporation, when used for coating a plate, is so great under the most favourable circumstances that it is to the bath alone we must look to bring a plate up to something like a natural temperature. We are, indeed, inclined to believe that cold is an absolute advantage in the matter of collodion, for it maintains its sensitiveness and its colour much longer when kept at a low temperature after using.

Far more important, because of its results being on the surface, is the question of the bath and its strength. If a print be sent out only half fixed, with portions of the chloride still remaining in its texture, it presents no difference in appearance from a print upon which the utmost care has been bestowed—if, indeed, it be not brighter from less prolonged soaking in liquid. But with a wet collodion negative the difference of a few degrees of temperature makes a most wonderful difference when beyond a certain point. If a bath of ordinary strength, such as is worked during the summer, be allowed to cool down to (say) forty degrees Fahrenheit, the resulting negatives have a constant tendency to turn out blue, cold, and flat-looking, having an appearance quite different from the rich mellow tone which distinguishes a first-class negative. Something of this is owing to the natural tendency to under-expose at the colder period of the year's operations, intensified by the diminished action of the chemicals usually following the abstraction of heat, without sufficient compensating allowance being made by the operator for the altered circumstances.

But when every allowance is made, and notwithstanding every alteration in the bath and developer, it still remains a difficult task to obtain good pictures with a temperature not much above freezing point; and it is well known that glass houses are more subject to atmospheric changes than ordinary brick-built and ceiled rooms.

With regard to the bath: it is requisite that its summer strength be increased by at least twenty-five per cent; for example, if it be customary to keep the dipping bath at thirty-five grains in summer, forty-five grains to the ounce will not be too strong for winter to provide against all contingencies. And a similar proportion for the floating bath may be adopted. Naturally, it will not be necessary, where perfect arrangements exist for keeping the dark room at a uniform heat, to make so material an alteration in the proportion as we name; but it must ever be borne in mind that a temperature which, on a winter's day, would be considered warm and confortable, would in summer time produce a feeling of chill. Thus no operator would complain of a dark room at 48° or 50° in winter, though in summer he would consider it actually cold. Again: there are very few rooms where, night and day, the heating is kept up.

We may draw attention to the fact that a liquid will part with its heat in a cool atmosphere very much more readily than it will absorb it. In other words, if the temperature of a room be allowed to fall, the liquids—bath, developer, &c.—will soon cool down (say in an hour's time) also; but when the temperature begins to rise it would take a much longer time for them to become warm again. A Winchester of bath or developer would take a day, and in a couple of hours' time would not be raised more than a few degrees. Now, as during the night time the temperature is lowest, and the heating generally allowed to fall off, it necessarily follows that in the morning, when the day's work is to be commenced, special arrangements must be made to warm bath and developer; and these are not comprised in simply heating the room and making it comfortable. These done completely, or to a limited extent, and the bath strengthened, no fear need be entertained of getting as good negatives as in summer; for the temperature of the plate at the time of exposure—as witnessed by the Arctic photographs—does not in the slightest degree interfere with the production of perfect results.

THE PHOTOGRAPHIC EXHIBITION.

[Concluding Notice.]

The *Rembrandt Study* (317) of Mr. J. M. Young is, in our estimation, the finest of the three excellent pictures contributed by this artist. In his *Quiet Cup of Tea* (319) the grouping and lighting are well managed.

Mr. Lafosse's picture, *A Few Finishing Touches* (316), is universally recognised as one of the finest works in the Exhibition. The sculptor in fine metal is here represented as engaged in the work from which the picture derives its title.

When we state that the various exhibits of Mr. R. Faulkner are quite up to the high standard of this gentleman's former work we have said all that is requisite. Besides contributing a charming collection of *carte* size portraits of children, Mr. Faulkner has also contributed pictures of greater pretensions as regards dimensions, in which art and photography are happily wedded.

The Woodbury Company exhibit a number and variety of works which, as respects quality, have never been surpassed. The frames numbered 426 and 428 contain several reproductions of engravings, after Landseer and others, which almost rival "proofs before letters," so great is their exquisite delicacy and beauty. Another frame of *Illustrations to "Prince Ritto"* (432) contains many dainty pictures. But the exhibits of this Company which possess most value, from a technical and educational point of view, are contained in a frame numbered 433, and consist of specimens of the metallic plates employed in the Woodburytype process, and placed side by side with each of these are impressions printed from the plates. Spectators never seem tired of expressing their wonder how these choice examples of photographic printing could be produced by such queer-looking plates; for, although the prints are exceedingly sharp, there is nothing in the appearance of the engraved plate to indicate the possibility of its yielding such a high degree of definition. This Company also contributes several large portraits (enlargements) possessing great merit, of which that of *The Marquis of Salisbury* (146), from a negative by Messrs. Lock and Whitfield, and also that of *The Bishop of Winchester* (182), are good examples.

Mr. Warnerke's display is of a decidedly instructive character. On the table is a very large and fine negative taken upon the negative tissue prepared by this gentleman. There are several examples of the suitability of this tissue for producing negatives from which enlargements of great excellence can be produced. The specimen of surface block-printing which hangs side by side with an engraving from the *Art Journal*, from which it was copied, is in every respect a work of great value. The charming delicacy of the *Art Journal* steel engravings is too well known to need comment, and yet Mr. Warnerke has, by means of a surface block, produced a *facsimile* of one of these admirable engravings, the difference between the two being so slight as to be undiscernible by all save an educated eye.

We conclude our observations on the pictures by remarking upon the admirable qualities of the various exhibits of the Autotype Company, both by the carbon process proper and by the autotype mechanical process. Among the works contributed by this busy Company there are many prints by the latter process which, for fineness of gradation, tone, and general excellence, might be equalled but could scarcely be surpassed by silver printing upon albumenised paper. Witness, for example, a frame (412) containing a dozen prints, in which these qualities are pre-eminent. In this frame is to be seen a picture from the original negative of *Windsor Castle*, by Mr. J. R. Sawyer, for the magnificent enlargement from which the medal was most worthily granted to the Autotype Company. In glancing at the adjoining frame (411), containing nine large mechanical prints, we are struck with surprise at the admirable results obtained from *reproduced*, and in some cases enlarged, negatives—for such, we are informed, has been the case as regards every negative used to print the proofs in this frame. To a higher degree of perfection in mechanical printing than that displayed in the works to which we have alluded, conjoined with four enlargements from *cartes* (430) and with the examples in several albums on the table, it seems scarcely possible to attain. We have so often spoken of the great excellence of the usual and well-known autotype enlargements that we have only here occasion to observe that the Company's contributions in this department of work will still further enhance their already high reputation. We may, however, direct attention to No. 163, an enlargement from a negative by Mr. A. S. Witcombe; to No. 53, *Glen Sheire, Inverary*, from a negative by Mr. Vernon Heath; and to *Windsor Castle* (5), to which we have already alluded, in proof of what we have stated.

With respect to the cameras and apparatus exhibited by Mr. George Hare, we shall merely observe that the workmanship and designs were faultless, but on these and on the ingenious camera of Mr. Woodbury we shall have more to say in our next.

Since writing the above the Exhibition has been closed. We are glad to be able to announce that it has proved highly successful.

To the numerous readers who have of late been expressing a desire to receive news from the French capital with greater frequency than they have been doing during the past few months, we have to explain that the state of Professor E. Stebbing's health has been such as to render it impossible for that gentleman to have forwarded more frequently his interesting communications to this Journal. How very useful and interesting were these occasional letters from the gay capital our readers are as cognisant as ourselves. Feeling that his health and increasing business avocations will no longer permit his retaining the position of French correspondent of this Journal, Professor Stebbing has at length reluctantly determined to retire from a position whose important duties he cannot fulfil to his own satisfaction. In taking a kindly farewell of Professor Stebbing as our acknowledged Paris correspondent we do not say farewell to him as an occasional contributor; for we are pleased to add that we have his promise to contribute to our pages whenever subjects of interest arise and leisure permit him to be serviceable to the Journal and its readers. In introducing Mr. W. R. Harrison as our future correspondent in Paris our duty, though very pleasant, is also very light. Mr. Harrison, our older readers will remember, most ably fulfilled similar duties in connection with this Journal in 1864-5, being the immediate predecessor of our lamented friend, Mr. R. J. Fowler, of whose decease, during the siege of Paris, European photographers were made aware at that eventful period. Mr. Harrison must, therefore, be looked upon as an old *attaché* of THE BRITISH JOURNAL OF PHOTOGRAPHY, who, from pressure of business, was compelled to forego what had been to him a "labour of love." Mr. Harrison is now, fortunately, in a position to devote more of his time to the requirements of this Journal than at the former period; and we have every reason to predicate for this department of our journalistic literature the most adequate representation.

A VERY large proportion of the photographs annually turned out in this country find their final resting-places in scrap-books or albums, the operation of mounting on cardboard being, in the majority of cases, dispensed with. But in how many collections of photographs of this description do we find the beauty of the pictures marred, if not ruined, by the crumpled, cockled, and generally untidy manner in which they are attached to the leaves of the scrap-book? Certainly it is not so easy a matter as it would appear to the uninitiated to secure the same even surface and smooth appearance we obtain when the print is affixed to a cardboard mount; but we think that a great improvement might be made upon the present system by the exercise of a little care. The great enemy to smoothness is, of course, the "cockling," which is inseparable from the use of an aqueous mountant, unless the support be stout enough to resist the contractile force of the photograph; but matters are made much worse by inattention to the state of the print itself previous to mounting. It is obvious that, if the print to be mounted be curled up into a tight roll, and probably covered with creases and inequalities, in order to make it lie flat it is necessary to let it absorb to its fullest extent the mounting paste, by which means it becomes for the time pliable, but, when dry, will exhibit the defect of "cockling" in its most aggravated form. The use of such mountants as india-rubber or gelatine dissolved in dilute alcohol, which do not exert a softening influence on the paper, is entirely out of the question when the condition of the print is such as we describe, as even the slightest wrinkle would be retained when mounted. The importance will thus be recognised of having the print as smooth and even as possible before mounting—a condition which will be found to receive due attention at the hands of the professional, as witness the numerous "scraps" to be seen in the print-sellers' windows, but which sometimes proves a troublesome or even difficult operation to the amateur. A hot smoothing iron is sometimes employed, but the result is not all that might be desired, and, though it gives a tolerably even surface, the print retains its liability to "curl." The following simple expedients will give an entirely satisfactory result, the print, after treatment, being perfectly flat and having a beautiful surface. After washing, the prints are dried, and the albumen surface rubbed slightly with wax. This may be conveniently done by using a mixture of wax and methylated ether of the consistency of butter; it should be soft enough to rub easily without penetrating the print and rendering it transparent. After waxing the print is immersed in clean water until thoroughly swelled, when the albumen side is pressed into close contact with a sheet of glass by means of the squeegee, and placed under slight pressure till thoroughly dry; it will then leave the glass in a perfectly smooth state, and with a high gloss. If the gloss be an objection, instead of using glass let two prints be pressed into contact face to face by means of the squeegee or a *warm* smoothing-iron, and placed under pressure between folds of clean, *dry*, blotting-paper. When dry, they may be separated as in the other case, and will be found to be perfectly flat. Prints so treated can be attached to the mounts by the *edges* only with india-rubber, and will present as even an appearance as if mounted on cardboard.

ON SOME NEW FACTS IN PHOTOGRAPHY IN WORKING WITH BICHROMATED GELATINE.

[A communication to the Photographic Society of France.]

WITH regard to bichromated gelatine, faults are occasionally met with by others which I have never experienced. This may proceed from the method I have adopted, and I believe it will be useful to make it known.

I dissolve one gramme of bichromate of ammonium in twenty c. c. of water, and I then add twenty c. c. of alcohol. Instead of plunging the carbon paper in this solution I fix it upon a support, and I pour a small quantity of the liquid upon the gelatine surface. It spreads rapidly, and the operation may be assisted by means of a triangle of glass. After having inclined the support in every direction for about one minute—which I do in daylight—the excess of liquid is poured off and the paper is hung up to dry in the dark room. Two hours suffice for its complete drying; I have even sometimes employed it within half-an-hour of its preparation.

Each sheet being prepared and sensitised with a new solution and dried quickly is in the most favourable condition for keeping good a long time. The alcohol gives solidity to the gelatine, and when the paper is sensitised in too high a temperature the film does not dissolve, as happens when the ordinary solution of bichromate is used.

A fact which appears singular at first sight is that during the high temperature of the summer the paper dries more slowly than during the winter. I attribute this effect to the gelatine, which, in an over-heated atmosphere, becomes slightly absorbent and retains the humidity.

I always use for my gelatine film a solid support of glass or porcelain to *depouiller* (clear) the image, as it retains and holds better than paper all the perfections of the picture. I employ the expression "*depouiller*"—that is, to wash and clear the image of foreign matter—in preference to the word "develope" generally adopted. It would have been better to have reserved the word "developer" to designate the action of sulphate of iron, pyrogallic acid, or the alkaline mixture; because we do not develope an image which already exists in the gelatine when exposed under a negative. We only clear away the substances which conceal or bury the image.

After the exposure the gelatine surface is plunged into water, and before the application of the transfer paper it is recommended to wait until the swelling of the gelatine permit it to lie flat. This method has its inconveniences. The swollen parts crush in some degree under the pressure exercised to drive out the water interposed between the two surfaces. The reliefs elongate, loosening from the transfer paper the parts influenced by the light, and it is precisely these which ought to adhere the most firmly, since they form the design; in fact, one sees the dark parts detach when the image is cleared.

After the exposure I steep the paper in water, but I do not wait until the gelatine is swollen to apply the transfer paper or support. With a shorter immersion it is seen immediately that the adherence is more complete, and the pressure of the squeegee upon the back of the paper cannot derange the image—only this requires the water to be of a little higher temperature for the clearing up of the picture.

Notwithstanding these precautions, there comes the fact that from time to time the dark parts detach from the support. I have tried substances which give greater adherence, but they tend for the most part to render the gelatine insoluble, which, with care, ought to be avoided. A solution of boric acid at two per cent. appears to me to be most effective. It can be applied to the transfer paper, which is then united to the gelatine tissue previously wetted.

In commerce I find some sheets more sensitive than others, and of very fine appearance; but the image they give becomes hard, and breaks in the water when it is too warm. I do not succeed except with the exercise of much caution. These inconveniences disappear when I sensitise with a solution of chromate of zinc. I have then been able to wash and clean my image in boiling water. That it lowers its force a good deal is quite true; but the image holds well to the transfer paper or support, and is reduced progressively with any abnormal action.

I cite this experience to prove the advantage of chromate of zinc; but in practice I would not employ it alone, for it produces hardness in the gelatine paper when it is dry. To obtain the desired effect it is only necessary to add a little to the ordinary bichromate solution; for example, two decigrammes to one gramme of bichromate of ammonium.

This property of chromate of zinc merits a trial in the different processes of photolithography; there appears to me to be less relief in the image it gives, which would prove advantageous under the ink roller, since it is the hollows which take the ink. Chromate of zinc is prepared by dissolving oxide of zinc to saturation in chromic acid.

I easily obtain vitrified images by the following process, of which I can only now give the principle:—The image having been washed and cleared upon a surface of enamel, glass, or porcelain, I soak it for some minutes in a solution of vitrifiable salts, principally chloride of gold, the excess of the solution being removed by washing, and after having dried the image thus prepared it is passed into the fire.

Abbé Laborde.

SPOTS ON EMULSION PLATES.

I really think I can throw some light on the causes of those pests—the spots on emulsion plates. I have found them very real bears, indeed, and not "bugbears," as "Free Lance" calls them—no effects of imagination only. A great deal has been written in the Journal about them and their causes, and I think a great deal that has been written may be briefly dismissed.

The legion-like forms of these spots forbid the idea of their proceeding from one cause. So old a photographer as myself cannot plead guilty to errors of manipulation; and, as to the particles of chemicals floating in the air of the operating-room, I always coat my plates in my dining-room, where there are no chemicals and very little dust. Five months ago, when in London, I bought a bottle of the emulsion sold by the Liverpool Dry-Plate Company. On returning home I tried it, and the trial filled me with despair. The spots were really a legion; and this was the more trying as, in all other respects, the negatives were perfect. This went on for some time, and, believing the fault to be in the emulsion itself, I was about to become my own manufacturer.

I had placed in the bottle of emulsion about an ounce of coarsely-powdered granite, which had been washed and dried. I prefer it to the small, round pebbles suggested by one of your correspondents; it is more severe in its action. I had occasionally given the bottle a shaking. Only last week I determined to give my emulsion a final trial before I set to work myself, and the plates turned out beautifully clean and quite free from spots of any sort. Here time had evidently caused the perfect assimilation of the chemicals composing the emulsion—not more difficult to understand than the ripening of ordinary collodion.

Last week I prepared a number of plates for my magic lantern, and I need not say this did not admit of spots of any kind. I must say I was surprised at the extreme sensibility of the emulsion. I got my beautiful transparencies in *five* seconds. Of course I am speaking of superposition. The light was a small paraffine stella lamp, with circular wick. The negative was placed five inches from this flame. I do not think that wet collodion would have done. This emulsion process is a charming one, and the negatives are of very fine quality.

I hope, for the sake of my fellow-workers, that their experience will corroborate what I have suggested as the *origo male.*

Clericus.

THE ART OF PAINTING ON THE PHOTOGRAPHIC IMAGE.

No. XI.

Perhaps no other method of painting is quite equal to oil painting in the solidity of its effects and its approach to nature. You can paint thick or thin, transparent over opaque, opaque or semi-opaque over transparent, smooth or rough, yet all having a peculiar effect and value. Those parts which are thickly loaded with colour are termed "impasto," whilst thin, transparent films of colour over others, or over grounds specially prepared to receive them, are termed "glazes." A thin veil of colour, partly opaque, driven over any part of a picture, is termed a "scumble."

Where a sandy or stony effect is wanted it may be rendered by painting roughly, or giving a tooth by painting with stiff colour and dabbing it, so to speak, with an upright brush, waiting a day or two until dry, and then glazing with appropriate tints or with dry colour—"dragging," as it is called—which consists, literally, of dragging the brush sideways over the rough under colour, or the same result may be secured by both methods combined.

I ought, perhaps, to have mentioned "dragging" in water colour. It is the same in principle, only that the natural roughnesses of the paper are taken advantage of to catch the colour, and most photographic papers are too smooth for the purpose.

Now I shall suppose you are going to commence to paint a head in oil. Mix on your palette tints of various depths of the following mixtures:—White, with a little raw sienna; white and Venetian red; Venetian red, white, and raw umber; raw umber and white; raw umber and Indian red; vermilion and white; and, lastly, a glaze of raw umber and Venetian red. With the latter, if the image be tolerably vigorous, just glaze the deepest shadows. This is only a temporary measure, but I have found it a great help to beginners. It seems to guide them in putting on the other tints, and partly to take away that hopeless look that a canvas photograph has when, for the first time, the tyro comes to put on the high lights and flesh tints.

Now, with plenty of colour and very little medium, paint in the high lights with white and raw sienna. To see the exact shape and size of these you should have a deeply-printed guide. Lay these colours on thickly—impasto, in fact. Some get excellent results by putting on these with a palette knife. Do not aim at too great evenness or smoothness, but let the brush-marks show, especially if the work be at all large. Next to these lay your Venetian red, white, and a little raw sienna; next to the foregoing lay your Venetian red, white, and raw umber; next your umber and white; and then for the deepest shadows Indian red, raw umber, and more or less white according to the depth required. Keep consulting your guide; do not mix or mess up your tints; let them fit into each other, as it were, with a jagged, saw-like edge. The result may look rather patchy. Do not mind that; but above all keep the tints clean, and lean towards a too great warmth of colour rather than coldness. Do not be in a hurry to make the darkest tints as dark as you ultimately wish them to be; put the carnations of vermilion and white boldly into the cheeks (not too dark), on to the lips, and, in some subjects, slightly on the chin and over the eyebrows. The bridge of the nose is often red in men who have been much weather-beaten, and looks well where the rest of the face is high in colour; but vermilion had better be kept out of the tip of the nose as much as possible.

The reader will observe I have recommended his first of all glazing the strong shadows with raw umber and Venetian red, and then leaving them and going to the highest lights, gradually working from them to the deep shadows, which may now be either wiped clean and painted with the raw umber, Indian red, and white, or this mixture may be painted into the glaze—just proceeding, in fact, as if it were not there at all. It has served its purpose, and may be done away with at this stage of the picture.

The eyes should be broadly indicated; the pupil with some rich brown—Vandyke, for instance; and the iris should receive some solid colour as a groundwork. For blue eyes a rather warm, greyish mixture of French ultramarine, Venetian red, and raw sienna, with, of course, white; indeed white should be freely used throughout this first painting in every tint laid on. For bluish-grey eyes more yellow may be used; for hazel eyes a good rich body of burnt sienna, raw sienna, and white. The eyebrows should be marked out rather firmly with a reddish mixture of raw umber and Indian red with white. The hair should be laid in in masses, not paying much attention to little matters of detail at present. Keep the lights cool, the middle tint of the real colour of the hair, and the shadows rich and warm. For black hair the lights may be of black and white, with a touch of Venetian red, the middle tint black, white, and raw umber, and the shadows laid in with black and burnt umber or burnt sienna. For ordinary brown hair different proportions of black, white, burnt sienna, and raw umber will give a great variety of tints. Of course these are only general rules. They must be a little varied to suit different subjects; but that the student will soon discover for himself. Chestnut hair has purplish lights: black and white and crimson lake. The half-tints Vandyke brown, white, and a touch of burnt sienna. The deep shadows had better be grounded with the same, but less white and more burnt sienna. Flaxen hair is well given by raw umber, Roman ochre, and white for the middle tints, with more white for the lights, and get the shadows with burnt umber and white. Golden hair may be secured by the same colours, using a greater proportion of Roman ochre and burnt umber. For grey hair use different proportions of black, white, and Venetian red, with more or less Roman ochre, as the grey is cold or warm. The lights of very silvery hair may often be given by pure black and white. Paint in the hair with long, sweeping touches. The hog's-hair brush will give a hair-like texture *at once* if properly handled—far more free than making separate strokes with little brushes. There is a brush made called a "fan brush," of fine hog's hair, which I have found most useful for painting hair, both in water and oil colours.

Joseph Wake.

A PROCESS OF REDUCING SILVER CHLORIDE TO THE METALLIC STATE,

PARTICULARLY SUITABLE TO AMATEURS.

[A communication to the Manchester Photographic Society.]

Many amateurs, I believe, trouble themselves very little about the reduction of photographic silver wastes, simply because they consider their small quantities not worth sending to a professional refiner, or that the process of reduction to the metallic state is troublesome, and not worth the expense. Now, the process I am about to describe is simple, effectual, and economical, snd particularly suited to the amateur, who has comparatively small quantities to operate upon.

As regards the precipitation of $Ag\,Cl$ from solutions containing $Ag\,NO_3$ we, no doubt all of us, make use of the same salt, namely, $Na\,Cl$.

In my own dark room is a large inverted bell-glass, into which are poured the washing water of dry plates and paper prints, the rinsings of glasses, baths, and other vessels which have contained $Ag\,NO_3$ in solution; and, at the end of the season, all the nitrate baths are added to be precipitated as $Ag\,Cl$ by the process just mentioned.

The precipitated chloride may now be well washed by decantation, dried, and weighed, or may be poured into the evaporating basin without washing. Add to the $Ag\,Cl$ about its own weight of $KO\,H$, or $Na\,OH$, and half its weight of cane sugar, with sufficient water to well cover the whole, and boil for about fifteen minutes over a Bunsen's burner. The solution turns muddy on applying the heat, but in a few minutes gets somewhat clearer, owing to the reduction of the silver, which settles on the bottom of the basin in the form of a grey powder, lacking altogether the metallic lustre of silver cast into ingots or buttons. The finely-divided silver is transferred to a precipitating beaker and well washed by decantation. The clear washing water is now tested with $Ag\,NO_3$ until no precipitate is obtained; the silver is then washed in two changes of distilled water.

There is nothing new in the above process. It is based upon the fact that solutions of sucrose or dextrose, in the presence of alkalies, reduce the salts of the noble metals to the metallic state—the chlorine, in the case of chlorides, remaining in solution.

At the commencement I stated that this was an effectual method of reducing $Ag\,Cl$, which I think I can prove. From one precipitation I had 5,663 grains of dried $Ag\,Cl$, which, according to calculation, would yield 4,262 grains of pure silver. I actually got 4,250 grains, being a loss of twelve grains, possibly accounted for by the chloride having absorbed moisture between drying and weighing; or probably a small quantity of kaolin may have been mixed with the chloride. The process is also economical, $Na\,OH$ costing about 4d. per pound, and sugar about 3d. per half-pound, which is sufficient to reduce considerably more than one pound of $Ag\,Cl$ to the metallic state without the expense of building a furnace; also less the risk of a broken crucible, and, possibly, the trouble of collecting the precious metal from the remains of a coke fire, which I know from experience is anything but pleasant amusement.

Those who prefer a crucible can obtain sufficient heat on an ordinary blacksmith's hearth, with a small coal fire. After the silver is well washed it is ready for dissolving in the $H\,NO_3$, which is quickly effected, owing to the fine state of division of the silver, the excess of acid being readily liberated by addition of washed and dried $Ag\,CO_3$, until effervescence ceases. It is as well, however, to add an excess, as it settles on the bottom of the vessel, and is easily dissolved by a few drops of $H\,NO_3$. The process of liberating the acid was recommended by the Editors of The British Journal of Photography some time since. In my own practice I do not take the trouble to crystallise the $Ag\,NO_3$, preferring to keep it in a very strong solution which is perfectly neutral so long as there is precipitate of $Ag\,CO_3$ on the bottom of the bottle. The strength is readily tested, either by the argentometer or, volumetrically, by a standard solution of $Na\,Cl$.

J. W. Leigh.

HAS PHOTOGRAPHY ANY CLAIM TO BE CONSIDERED A FINE ART?*

Among the objections constantly urged against photography by the critics is that a true picture must bear the impress of a soul, and there is no soul in a photographic camera. Of course there is not, any more than there is in the brushes and palette of the painter, or in the chisel and mallet of the sculptor. But the artist who employs them has a soul, which he impresses on his work. It is the artist whose *soul* must impress the work, not the artist's tools; and the camera is the artist's tool when an artist chooses to use it, exactly as are the brush and chisel—the latter a tool somewhat less controllable, working in materials less plastic, and, therefore, making the triumph all the greater when it is achieved. This argument has been so often refuted that one is almost led to believe that those who use it think photographs can be ground out of a camera the same as tunes out of a barrel organ.

Again: it is said by some that you cannot get the expression of the mind—that you cannot photograph an idea. You can, and if you only know what expression represents any certain passion you may induce it; you can imbue your model with the idea you wish to portray. The artist can bide his time; if one model cannot, another may. Some men could represent most of the expressions that Le Brun has delineated. Photography is eminently fitted to catch and retain transient expressions which may be caught or induced by the artist—a fact which is not so certain when painting from nature.

Many complain that if you extend your hand it cannot be reproduced by photography without distortion. No more can it be drawn if you draw as you see it; for, if you sit at a moderate or usual distance from a model, then the angle from your eyes, on either side of the hand extended, to the figure will appear disproportioned in the drawing. Sometimes it is done so. For example: in Raphael's cartoon this is so as regards the fisherman in the boat appealing with his hands. If you examine a good copy of that cartoon you will find a great difference in the size of the hands. During the period I attended the School of Art I have seen the same thing exemplified in almost every front view drawing that was made of the *Fighting Gladiator*. The clenched fist of the left arm extended in front always looked unnaturally large, while the right hand thrown behind looked, in comparison, disproportionately small. I remember, on one occasion, seeing both master and pupil puzzling over it, and after the usual aërial measurement—that is, by holding up a piece of paper between the eye and the object—marking off the size of the hand and comparing it with other parts of the figure, they were obliged to confess it was correct, although to the eye it did look disproportionate. This difficulty could be obviated at once by simply drawing the figure from a more distant point of view. Probably Raphael saw the same objection to his figure as well as any of his critics. He having drawn the figure with his model too near him, and being convinced it was true to nature, adopted it as the truth and placed it in his cartoon. But it may be asked—"How is the photographer to surmount this difficulty in his sun drawing?" By a very simple expedient. If his figure must be taken of a certain size he has only to use a lens that will take it much larger than it is wanted, and he can at once retire to a more distant point of view, the same as the artist—in other words, use a longer-focussed lens.

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* Continued from page 524.

It is objected that there is no individuality in a photograph. There is individuality in good photography. If you put three good operators into the same glass house, with the same chemicals, the same lens, the same subject, and the same conditions of light, they will each produce pictures, it may be, equally meritorious, but distinctive of their individual modes of manipulation, just the same as painters form distinctive mode of manipulation; and you can point to a picture on the walls of an exhibition and say that is done by so and so. It is markedly so in landscape photography. Photographers who are familiar with the style of the artist can distinguish Wilson's from Annan's, Annan's from Bedford's, and Bedford's from England's; and the more photographers study art principles the distinctiveness and individuality of their work will become more and more manifest than they are at present.

Again: it is further objected that photography connot idealise. Here at last the critic has photography on the hip. They assert there is a great distinction between the photographer and the ideal picture maker; that the "one simply portrays, the other tries to create." This is a distinction which the most staunch upholders of photography will readily admit; but it in no wise disposes of the art claims of photography. All art in painting is not creative art. Much very excellent work is imitative art, but not the less fine art. The imitative artist in painting will give the impress of his mind to his works in his mode or manner of treatment; and in like manner, if not in like degree, will the photographer impress his mind on his work.

The critics ask if works of the best pictorial photographers, such as Rejlander, Robinson, Slingsby, Lake Price, and others can be called "suggestive." Some of them are pronounced eminently suggestive by men who are perfectly capable of judging. We deny that suggestiveness is the touchstone of art. That it is a very high quality in art cannot be doubted, but we cannot admit it is the sole touchstone of art qualities; besides, it is too vague. Suggestiveness requires a constitution and capacity of mind in the observer as well as certain qualities in the work of art itself. Peter Bell might have objected that a primrose was not suggestive because

> "A primrose on the river's brim
> A yellow primrose was to him,
> And it was nothing more;"

while to Wordsworth that primrose, or even the meanest flower that blows, suggested thoughts the most profound. ANDREW BOWMAN.

(To be concluded in our next.)

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FOREIGN NOTES AND NEWS.

HERR LEMLING ON TOO THIN AND TOO DENSE NEGATIVES.—HERR KRAUS'S CHROMOPHOTOGRAPHS UPON CONVEX GLASS.

THE *Correspondenz* has an article, by Herr J. Lemling, of Marmagen, upon how to treat negatives which are either too dense or too thin for various photographic purposes. When a thinner negative is required for lichtdruck purposes, for example, than one possesses, Herr Lemling would first make a thin positive, having all the sharpness of the dense negative, by prolonging the exposure until a slight image was already visible, and then using a weak developer and silver addition. From this positive he prepares the desired negative. On the other hand, when he wishes to have a dense picture from a thin negative, he lays the negative upon a dry plate, and with a rather short exposure and a suitable development, he gets a transparent positive, which is already much more powerful than the original negative. Then from the positive he gets another negative print upon a second dry plate, and, by regulating the exposure, gets the required density. This is a process only suitable for certain sorts of thin negatives; but in every case in which a negative—whether varnished or not and whether old or new—requires power and covering he recommends applying his enamal colour process to the picture film, by means of which he can give at will any desired density to either the whole or any separate part of a weak negative. This is a useful process truly, only unfortunately Herr Lemling does not tell us what his enamel colour process is, though he promises further information to his colleagues. It is to be hoped some of them will soon obtain the desired information, with liberty to publish it; meantime, as in so many other cases, we must wait and see what time will bring forth.

In the *Monatsblätter* Herr Kraus gives a new version of the way to render silver paper photographs transparent enough to allow of their being coloured from the back. Not having seen any of Herr Kraus's production it is, of course, impossible to pronounce upon their merits; but, from the name, "chromophotographs upon convex glass," one is inclined to suppose that they must have an effect very similar to that of those imitation enamel portraits of Napoleon III., the ex-Empress of the French, and other celebrities, which were so popular and so prominently displayed some nine or ten years ago in Parisian shop windows. Be that as it may, he who would produce a chromophotograph upon convex glass should proceed as follows:—He must take an unmounted powerful print, and cut it somewhat smaller than the convex glass; moisten it with clean water, and place it, picture side uppermost, upon a clean sheet of glass. The superfluous water must be removed with blotting-paper, and the surface pasted over with prepared paste. Then lay it upon the inner side of a convex glass, previously cleaned with ammonia, and also coated with the paste; now place a piece of smooth, firm paper over the picture, and rub out with it all blisters and superfluous paste. The picture should be held in the left hand, glass side uppermost, so that the operator may see what he is doing, while with the right hand he rubs, exercising a light but equal pressure, and working from the middle towards the edge. The smooth paper will require to be replaced several times. When the picture no longer shows either creases or air-bubbles, and when all the paste has been completely pressed out, it is left to dry. Should any air-bubbles be still visible when the picture is dry the paper picture must be moistened again and treated as before. When completely dry the back of the picture must be smoothed with fine sand-paper. When the picture is dark it will stand a good deal of sand-papering; but when it is light it will not, though a little is always necessary in order to remove any impurities left by the paste and to prepare the paper for the transparent medium. When quite smooth the picture is dipped into a tin dish containing a quantity of melted Kraus's transparent fixing medium (cetaceum and paraffine). This dish should be placed in a vessel containing hot water in order to keep the preparation fluid; but it should not be made too hot for fear of yellowing the whites of the albumen print. In twenty minutes or half-an-hour the picture will have become quite transparent. It may now be taken out and the glass side cleaned, but the paper side *must* be allowed to cool first, after which the superfluous medium may be removed with a rag, the glass slightly warmed and laid upon a cushion, so that it shall not break. The picture is now ready to be painted. All the whites—such as the collar, cuffs, whites of the eyes, &c.—are painted directly upon the back of the picture in permanent white, as are also the eyes, the lips, flowers, and jewellery in their proper colours, care being taken to keep to the outline. When that has been done a second convex glass is laid behind the picture, and the edges of the two glasses fastened together by a strip of gummed paper. One then mixes some flesh colour, and at the back of this second glass paints over the whole face, and with suitable colours the hair, background, &c. The principal precautions to be taken are to keep to the outlines, and to put on the colour so thick as to be perfectly opaque. It is to ensure this last condition that opaque white is principally used in mixing the colours. When the painter has finished a pasteboard mount is pasted on to the back, and the picture is placed in a velvet frame. The colours specially prepared for this process are permanent white, burnt ochre, golden yellow, carmine lake, vermilion red, kaiser brown, ultramarine, brilliant green, and velvet black, and along with them some further instructions are given for their use. When the painter makes a mistake in laying on the colour it may be removed by a rag dipped in oil of turpentine. The colour should be mixed upon a palette or a piece of glass, and after each time of using the pencils should be cleaned with oil of turpentine.

The paste spoken of by Herr Kraus appears, on reference to a back number of the *Monatsblätter*, to have been originally published in the *St. Louis Photographer*, and to be of the following composition:—Four parts of strong starch flour and one part of strontic nitrate boiled in ten parts of water; and the bath for rendering the picture transparent seems to be composed of one part of glycerine to nine parts of castor oil.

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Meetings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE meeting of this Society, on Tuesday evening last, partook of the character of a *soirée*, at which there was a large attendance of ladies as well as gentlemen. The *business* was mainly confined to the presentation of the medals to the respective exhibitors to whom they had been awarded by the jurors appointed for that purpose.

The chair having been taken by Mr. James Glaisher, F.R.S., President of the Society, the following gentlemen were admitted as members:—Messrs. H. B. Berkeley, J. C. Witcombe, E. De la Grave, T. D. Bingham, A. T. Lafosse, A. E. Durham, F.C.S., Percy Vernon, and C. R. Livermore.

The President then proceeded to deliver the medals to the successful competitors, as follows:—

For the two pictures which display the greatest general excellence, *When the Day's Work is Done* (281), by H. P. Robinson, and *Tired Companions* (241), by G. Nesbitt.—The former, he said, was a very excellent example of combination printing from many negatives. The difficulties attending the production of pictures by such means have been in this instance most skilfully overcome, the result being an undoubted success. The general design of the subject is well conceived and artistically carried out, and in the concentration of light upon the figures an effect (similar to what Rembrandt painted) has been very happily produced, and in all the arrangements of detail this photograph gives evidence of an artistic aspiration successfully realised by photographic means. He (Mr. Glaisher) then handed the medal to Mr. Robinson amid great applause.—In presenting to Mr. George Nesbitt the medal for the latter of the above pictures, the Chairman said that with a few materials a picture had been produced which satisfied the artist in its composition, the public in its sympathy, and the photographer in its manipulative skill; and of its kind it was another successful example of the pictorial capabilities of photography.

For the best landscape 10 × 8 and under, and for the best above 10 × 8—*Wickham Bridge* (117), by Edward Brightman; and *Ullswater* (501), by Payne Jennings.—The former of these, Mr. Glaisher said, are small landscapes, but full of delicacy, showing an appreciation of the beautiful in nature. Art and science in these studies have both been utilised to produce a happy result.—With regard to the latter, he said that the characteristic feature of the landscapes by Mr. Jennings is the harmony which prevails throughout the entire work—force of foreground with soft distance, exquisite detail combined with aërial gradation, well-chosen points of view evincing pictorial taste, and, to sum up all, great refinement in the composition and treatment. [Mr. Payne Jennings was present to receive his medal; that for Mr. Brightman was ordered to be forwarded to him.]

In handing to Mr. Blanchard the medal for the best portrait above 12 × 10, *Hugh Owen, Esq., F.S.A.* (276), the President said it was valuable as illustrating the suggestiveness of attitude as indicative of the sitter's character, and hence great praise was due to so artistic a study.

In awarding the medals for the best figure study 12 × 10 and under, and for the best above 12 × 10, respectively to *Keolanthe* (334), by Mr. Blanchard, and portrait (383), by Mr. O. Angel, the former, he said, is a single figure subject, in which the severities of classical art have been exercised in the arrangements of the pose and in the folds of the drapery, as also in the general treatment of the picture, which looks like a copy from some work by a classical painter—so much the more merit being due to a photographer for producing so fine a work.—Respecting Mr. Angel's picture he said:—It is not only an excellent example of the collodion transfer process, but, as a study from life, it is admirable for the successful imitation of the style of the painters, Reynolds and Gainsborough. Softness and delicacy are the especial features of this work, the result being that there is an absence, especially in the face, of extreme dark shadows—the picture, as a whole, being very satisfactory. [Both Mr. Blanchard and Mr. Angel were present, and received their medals in person.]

For the best enlargement untouched, and for the best enlargement and negative, both being the work of the exhibitor:—Enlargement by solar camera (35), by Dr. D. van Monckhoven, Ghent, and *Windsor Castle* (5), by the Autotype Company.—Dr. Monckhoven's work the President characterised as a most perfect enlargement, showing that when a good and original negative has been secured, possessing the best qualities, the system of Dr. Monckhoven can produce an admirable *facsimile.*—Of the picture of *Windsor Castle* he said it was a good example of enlarging by the autotype process from a negative evidently taken with great care and attention to pictorial effect. [The medal for the latter was handed to Mr. J. R. Sawyer, by whom the negative had been taken. Dr. Monckhoven was not present.]

For the best *genre* picture the medal was awarded to Mr. E. Cocking, for *Cross Purposes*—scene from "The Happy Pair" (472).—The President said this work was a successful attempt to illustrate an incident of a dramatic character, where the value of duplicate lines in composition helped to illustrate the subject. The picture evinced a sound knowledge and careful application of the canons of art in its arrangement.

For the best photo-mechanical prints:—Frame exemplifying Woodburytype (433), by the Woodbury Company; and buildings, views, plans, &c. (541*a*), by Strumper and Co., Hamburg.—The medal for the former was handed to Mr. Whitfield, with the remark by the President that the results were very wonderful, the appliances being such as would appear almost impossible to realise.—The latter works, he said, were treated in a most efficient manner, showing that none but an experienced architect could have chosen such surpassingly-beautiful points of view.

The medal for the best instantaneous picture was awarded to Mr. W. Durrant for his picture, *Shipping* (150). Concerning these views (of yachts), the President said they evinced great skill in arrangement of position and decision at the proper time at which to expose.

Respecting the medal for the best frame of dry-plate photographs, awarded to Mr. William England for his *Swiss Views*, the President said that as specimens of dry-plate work they were perfect; and when the various difficulties arising from local colour—affecting distances—combined with the foreground colours of a totally different nature were considered, they showed that some mastery had been obtained over dry-plate work when put in competition with wet. [Mr. England was present to receive his medal.]

In bestowing the medal for the best microphotograph, awarded to Mr. Edmund Viles for the *Proboscis of Blowfly* (105), the President said that, as an old president of the Microscopic Society, numerous photographs of microscopic subjects had come under his notice, but in no instance had he ever seen any which could come up to that of Mr. Viles. He was sorry that gentleman was not present that evening in order that he might grasp him by the hand and congratulate him upon the admirable manner in which he had accomplished one of the most difficult tasks that the photographer could undertake. It was a photograph which the more it was critically examined with a magnifying glass the more details did it disclose.

The jury had awarded to Mr. Warnerke the medal for the best specimen of surface printing from a photo-relief block. This gentlemen, the President regretted, was absent, but a specimen like the one in question displayed skill and inventive power, which might yet create a revolution in the illustration of literary works.

Special medals having been awarded to Mr. W. J. A. Grant for his *Arctic Views* (101), and to Herman Rückwardt, of Berlin, for his *Interiors* (551*a*), neither of whom were present, the President spoke of the former as being so good that no one thought of the great troubles attending photographers operating under such conditions, while the latter were singularly perfect specimens.

The Chairman concluded amid applause, and the remainder of the evening was devoted to the examination of the pictures and to social conversation.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

The Board of Management held their monthly meeting on Wednesday, the 7th instant, at the new office, 160A, Aldersgate-street, E.C. The minutes of the previous meeting were read and confirmed.

A member of the Association having recently died, the application of the widow for relief was then entertained. After receiving the careful consideration of the Board, a resolution to appropriate a sum of money adequate for the purpose was proposed by Mr. Sisman, seconded by Mr. Bolas, and carried unanimously.

Grants for various purposes were then voted, and the meeting was adjourned till Wednesday, December 5th.

EDINBURGH PHOTOGRAPHIC SOCIETY.

The annual general meeting of this Society was held at 5, St. Andrew-square, on the evening of Wednesday, the 7th inst.,—Mr. John Lessels, President, in the chair.

The minutes of the previous meeting were read and approved, and the following gentlemen were admitted ordinary members:—Messrs. G. J. Brewster, R. W. Huie, J. H. Forbes, W. Gray, W. Mitchell, Walter J. Jones, John Bonar, and J. Denovan Adams.

The President laid on the table several copies of *A Treatise on the Sphere, with the Theory of the Sun and Moon, and the First Book of the Geography of Claudius Ptolemy of Alexandria*, reproduced by a photo-mechanical process by Senior José Julio Rodrigues, of Lisbon, which had been forwarded for presentation to the Society.

The Secretary then read the Couucil's report for the past year, which was as follows:—

ANNUAL REPORT.

Your Council, in presenting this the eighteenth Annual Report, have pleasure in congratulating the members on the continued prosperity of the Society. During the year the Society has lost by death five members. Among these are included the Hon. W. H. Fox Talbot, who may, so far as this country at least is concerned, be considered the father of photography, and the Rev. D. T. K. Drummond, one of the most successful amateur photographers and most genial of men included in the roll of membership of the Society; and by resignations, from removals and other causes, 29; but there have been added 73 ordinary members (a net gain of 39), thus showing a membership of 312 at the present date, as against 273 at this time last year.

During the session there have been held in all seventeen meetings, including nine ordinary, five outdoor, and two popular meetings, and the annual excursion to Almond Dell. The attendance throughout the year has been highly satisfactory; and, while the Council would be pleased to receive a larger number of papers of a practical nature, they cannot help congratulating the Society on the work that has been done. The following papers have been read at the ordinary meetings:—

1. *The Aims and Objects of Photographic Societies, with Suggestions for Increasing the Prosperity of our Own.* By Mr. E. R. Yerbury.

2. *The Works of Kareline.* By Mr. Norman Macbeth, A.R.S.A.
3. *Our Outdoor Meetings.* By Mr. James Crighton.
4. *The Platinotype Process.* By Mr. T. Rodger, St. Andrews.
5. *The Ventilation of Photographic Studios.* By Mr. John Laing, F.R.S.S.A.
6. *A Few Experiences in the Studio.* By Mr. Peter Low.
7. *Odds and Ends.* By Mr. W. T. Bashford.

During the session there have been three distributions of pictures, contributed respectively by Mr. James Howie, Mr. H. H. Pillans, and Messrs. Nimmo and Son. The Society has also been indebted to Mr. A. L. Henderson, of London, for the exhibition of a series of beautiful enamels; to Messrs Kemp and Co., for a new form of sciopticon; to M. Ganz, of Brussels, for a series of transparencies for educational purposes; to Mr. G. J. Tunny, and Mr. Paton, of Greenock, for pictures in illustration of the supposed method of lighting adopted by Mr. A. Kareline, of Russia, in the production of the picture to which was awarded the gold medal at the exhibition; and to Mr. J. M. Turnbull for an improved form of actinometer.

The outdoor meetings were held at Cadzow Forest, Bothwell Castle, Arniston, Aberdour, and Largo. The popular meetings were very largely attended. At the first was exhibited a series of views illustrating Aberdeen and its surroundings, by Mr. G. W. Wilson; at the second a series of views illustrating the late Arctic expedition. The lecturer on both occasions was Dr. John Nicol.

Your Council acknowledge with gratitude the liberality of Mr. John Lessels, President; Mr. George A. Panton, Vice-President; Mr. Kareline, Russia; Mr. Gutekunst, Philadelphia; Mr. W. H. Warner, Wales; and Mr. R. Philip, India, for their contributions of photographs, which have been added to the Society's collection.

Your Council have much pleasure in expressing their gratification with the results which have arisen from the presentation, for the first time, of a high-class print to every member of the Society, as well as the supplying of an equally-valuable work of art at the cost of production; and they take this opportunity of expressing their thanks to Mr. Nesbitt, of Bournemouth, and Mr. Adam Diston, of Leven, for the use of their negatives for that purpose.

Your Council, in their report of last year, referring to the then proposed exhibition of photographs, &c., expressed a hope that it would reflect much credit upon the Society, and at the same time do much to give a new impetus to photography in our midst. They have now much pleasure in congratulating the Society on that exhibition having proved a success far beyond the expectation of its most sanguine promoters.

In conclusion: your Council cannot help congratulating the members on its present highly-prosperous financial position, as, notwithstanding the fact that the presentation prints have entailed an expenditure of nearly £18, the Treasurer's accounts show a balance in favour of the Society of £54 15s. 1d., as against £36 19s. 3d. last year.

The Treasurer also read his report, and both reports were unanimously approved.

The meeting afterwards proceeded to the appointment of office-bearers for the current year, and the following gentlemen were elected:—*President:* John Lessels.—*Vice-Presidents:* Dr. James A. Sidey, George A. Panton.—*Secretary:* H. H. Pillans.—*Corresponding Secretary:* W. T. Bashford.—*Treasurer:* Alexander Mathison.—*Lecturer:* Dr. John Nicol. The four members of Council, appointed in the place of those who retired by rotation were James Henderson, W. Gilmour, M. G. Dobbie, and Frank Moffat.

It was resolved to hold a special meeting on the 16th inst., when Mr. F. York, of London, would give an exhibition by Keevil's patent lantern. After the usual votes of thanks were passed the meeting was adjourned.

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MANCHESTER PHOTOGRAPHIC SOCIETY.

The ordinary monthly meeting of this Society was held at the Memorial Hall, on Thursday evening, the 8th inst., when Mr. G. T. Lund, Vice-President, occupied the chair.

The minutes were read and confirmed, and Mr. Colin Mather and Mr. John Chadwick were elected members of the Society.

Mr. J. W. Leigh read a paper on *A Process of Reducing Silver Chloride to the Metallic State.* [See page 546.]

The Secretary read the following note from Mr. J. B. Payne, and handed round a specimen print which formed the subject of the communication:—

November 6, 1877.

Dear Mr. Adin,—I herewith send you two prints, as promised. I have long been interested in the matter of fading of photographic prints, and had come to the conclusion that, all conditions being properly fulfilled, a silver print was just as permanent as any other; but these conditions imply that you must begin with the manufacture of the plain paper, and go right through the various processes from beginning to end with the greatest possible care.

Then, again, I believe that there is some sort of an unexplainable influence on the part of the negative; some negatives, although appearing very good ones, do not produce satisfactory prints, and, again, I have oftentimes thought that a print taken from a weak negative faded soon. In the matter of toning solutions I had pet ideas, and, as regards "washing after fixing," I am sure that it is possible to, and that operators very often do, wash too long. A great deal depends, also, upon the quality of the solution that a print is mounted with, and the material it is mounted upon.

I was very much interested by a paper given by Mr. Brothers, at one of the Society's meetings some time ago; and, reasoning from what I saw and heard on that occasion, and also from my own experience, and from the large amount of information which I have obtained from photographers, both professional and amateur, I had come to the conclusion that the permanency of a silver print depended upon the purity of the materials employed and the careful manipulation of the operator; but the two prints I send you herewith completely upset all my theories. They were printed by Mr. Dixon, and I have his assurance that he used extraordinary care with them. Mr. Dixon is a gentleman of considerable experience, and is a most painstaking operator. He was interested in what I had mentioned to him from time to time regarding the fading of prints, and in response to a few remarks I made to him not long ago he kindly printed these two pictures for me. In a note, sent to me this week, Mr. Dixon says—"I should have expected a long tenure of life for at least the toned one." I enclose details of particulars.—I am, yours faithfully, J. Buxton Payne.

Particulars Relating to the Two Prints.—They are printed from the same negative on the same albumenised paper. It was pink tinted. Both floated on the same sensitising bath. Printed to *exactly* the same depth. Washed together. Fixed together and washed together. In fact, they agree in every particular with each other as precisely as possible, except that one is toned and the other is not toned. The one that is toned is No. 1, and it was toned with chloride of gold and carbonate of lime. They were printed in the second week of July of this year. They were both mounted in precisely the same manner; that is, by touching the margin only a quarter of an inch all round with mounting solution, and, being on the same mount, have consequently been exposed to the same conditions of atmosphere and light.

The Sciopticon.—It may be interesting to some members who work the sciopticon to know that Mr. Woodbury recommends that the two pieces of glass which protect the flame should be made especially of *toughened* glass, which, he says, is not affected by heat, and therefore all chance of breakage is prevented. I have tried it with success.—J. B. P.

The prints exhibited were two portraits of a lady from the same negative, vignetted, with a dark margin. The untoned print retained its original colour and other qualities throughout. The toned one also exhibited no appearance of fading as far as the portrait was concerned, but what had been the dark margin had almost entirely disappeared.

It was suggested by several members that Mr. Payne's communication might perhaps afford a clue as to the cause of one margin having faded, and that it might have been printed under much the same conditions as a print from a thin negative—that is, quickly, in a stronger light than the other; but, in the absence of any statement to that effect, the subject was not pursued further.

Mr. W. J. Chadwick exhibited one of Mr. W. B. Woodbury's new and ingenious tourist cameras.

Mr. Leigh showed some specimens of albumen films stripped from their original paper support by a friend of his.

Mr. McCall, on behalf of Mr. F. York, exhibited one of Keevil's patent lanterns, in which the members appeared to take great interest.

A vote of thanks was passed to these gentlemen for their kindness. The meeting, which was numerously attended, was then adjourned.

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Correspondence.

Cartes de Visite by M. Seguin.—Prof. Stebbing on Orange Light.—M. Berthaud's Photo-Mechanical Printing.—M. Martens' Panoramic Daguerreotype.—M. Davanne on Gelatine Filters.—M. Chardon's Carbon Prints.—M. Davanne on Fixing.—Abbé Laborde on Carbon Printing.—M. Vidal's Photochromie.—Gillot et Fils Photo-Typography.

The opening meeting of the session of the Photographic Society of France was held on Friday last, the 9th inst., and, considering the state of the weather, was very well attended. The chair was occupied by M. Davanne, President of the Committee of Administration, supported by the following members thereof:—MM. Audra, Alfred Chardon, Ferrier, Gobert, Pector, and Roger. The absence of the Honorary Secretary for Foreign Correspondence, M. Perrot de Chaumeux, was regretted. Being mayor of his commune, he was detained by his municipal duties. His presence at the following meetings was hoped for by his official colleagues, for being a barrister renowned for his legal knowledge, especially on patents and patent rights, by such questions invariably cropping up his attendance becomes of great importance, in addition to which his courtesy and good humour render him a valuable member of the Society.

After the election of new members the correspondence was read. M. Seguin sent some *cartes de visite* printed in carbon on *papier stucqué.* They showed great fineness of detail, quite equal to chromotypes in that respect, and had all the appearance of prints on very brilliant doubly-albumenised paper.

Then followed the review of the French and foreign journals—a popular portion of the proceedings of the evening.

Mr. Stebbing stated that he formerly used in his dark room a lamp burning essential oil, surrounded by orange-coloured paper, giving a feeble non-actinic light by which to perform his necessary manipulations in the preparation of dry plates and of washed emulsion (bromide of silver), for which there is a large demand in France. He stated that he now uses the coloured sheets of M. Bardy, and showed a large sheet of a fine deep orange colour totally impervious to white light, and which enables him to have a flood of light in his no longer dark room. He has practically tested the efficacy of M. Bardy's production.

M. Frank de Villecholles has made the following experiment:—He placed a wet collodionised plate for seven or eight minutes nearly in contact with the sheet, and by an after-exposure in his studio detected no difference in its sensibility; also the experiments of M. Bardy proved the value of the preparation.

M. Davanne, on behalf of M. Berthaud, showed his first trials of photo-mechanical impressions in printing inks, which were remarkable for their effect and fine definition. The printing was done upon paper called "*stucqué.*" Thanks were voted to M. Berthaud.

M. Frank, in admiring the prints of his friend M. Berthaud, said M. Vidal used also *papier stucque*, but which differed from most paper in retaining the carbon image during its development in the warm water.

M. Chardon, on behalf of M. Darlot, the optician, begged the Society to accept, for its archives, a daguerreotype obtained in 1844 with the panoramic apparatus of M. Martens. This plate was taken twenty-three years ago by the old veteran, and consists of a view of Paris and of the Seine, near the palace of the Tuileries. It is a most charming and masterly composition of light, shade, and movement, and is in as perfect a state as when taken, the silvered plate having been curved to suit the focus of the lens used. The plate is now flat and glazed, and framed in the usual manner; the picture being, of course, reversed, as in the usual portraits by the process. Cordial thanks were voted to M. Darlot for his valuable gift.

M. Davanne said that in the later forms of panoramic cameras the defect of the reversed image was got over by curved glasses, &c., but the inherent difficulties attending that branch of the art had caused it to be nearly abandoned. He (M. Davanne), on behalf of the maker, exhibited an old form of filter which in these days of gelatine processes he thought should be again brought forth from the back shelves of the shopkeepers. The filter was formed of a conical copper jacket, leaving a space of about half an inch round the interior glass funnel, the narrow delivery point appearing below the copper jacket; to this was attached a small pipe and funnel in copper, down which was poured hot water. At the bottom of the copper funnel projected an arm in the same metal, under which might be placed a spirit or gas lamp to maintain or augment the heat of the water, which, following the natural law, mounted upwards, and so formed a current of warm water all round the glass funnel, thus facilitating the filtration of such viscous substances as gelatine. The whole stands on three iron legs. [Should any of my readers desire to procure one of these filters your correspondent would purchase one for them with pleasure.]

M. Chardon passed round a large collection of proofs in carbon, about 12 × 10, printed by himself from his pure bromide of silver emulsion negatives, taken during the vacation in the Vosges—a department noted for its beautiful scenery. It is impossible to decide which to admire most—the skill of the artist in the choice of his subject, his light and effect, or the peculiar warm blue-black tone of the carbon prints; in short, the mounting, the portfolio, and the case bespeak the man of taste cultivated by research and practice as the head of one of the largest copperplate publishing and printing establishments in Paris. He chooses carbon paper containing the best colouring matter; otherwise the proofs would have a slightly-yellowish colour.

M. Davanne read a paper upon the fixing of negatives obtained by the emulsion process of M. Chardon, and exemplified it most fully by negatives treated as described. His conclusions were—that the opalescence which remains upon negatives after being fixed and after drying is due to the pulverulent structure of the collodion film, and not to any bromide of silver remaining in the film. M. Chardon recommends sulphocyanide of potassium or ammonium at twenty per cent. for fixing.

M. Chardon read a paper, by the Abbé Laborde, *On Some New Facts in Photography in Working with Bichromated Gelatine.* [See page 544.]

M. Vidal exhibited various specimens in photochromy, and made some remarks on the pictures exhibited.

M. Gillot made a communication on chemical engraving. After speaking of the weak points connected with the present processes of photo-engraving, he said that when an artist should be able, without the aid of an engraver, to turn out work imitating, more or less, wood engraving, but with all the fine lines of a copper plate, the end sought for would be accomplished. He (M. Gillot) then proceeded to give his own method of procedure as follows:—The drawing is made on a Bristol board, coated and prepared with white lead; the artist takes a small "*malette*" and rolls it upon his drawing, to form the "*tailles en creux.*" The *malette* can be applied in any desired direction. We have then a relief wherever the *malette* has passed. By rolling the *malette* horizontally and vertically hollow lines are made, crossing one another, and there remains a square point. When these operations are completed draw with a lead pencil or a lithographic pencil (very hard). The pencil in passing over the paper can only touch the minute projecting points, while the "*tailles en creux*" produced by the *malette* remain white. By examining a *cliché* attentively a judgment can be formed of the progress in this process. For greater facility the drawing can be made larger, and reduction by photography to the right size imparts to the lines of the drawing and the work of the *malette* more fineness, and there only then remains to make the photograving by the ordinary means we employ.

A patent has been taken out by M. Gillot. The prints were illustrations of *Life in London and Paris*, after Adr. Marie. They had all the appearance of being printed from copper plates, and were admirable specimens of the progress made by Gillot et fils.

The order of the day being finished, the *séance* was adjourned.

W. Harrison.

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MR. J. R. JOHNSON'S NEW PATENT.

To the Editors.

Gentlemen,—I read in the number of The British Journal of Photography, which I received at ten o'clock last night, the description of Johnson's patent, upon which I beg to make some observations.

Mr. Johnson lays claim to the employment of alizarine in combination with a metallic earth which does not render the gelatine insoluble. Now permit me to state here that the tissue which I manufacture under the name of "red chocolate" is no other than a mixture of black with the precipitate well known to dyers, which forms the acetate of peroxide of iron in an alkaline solution of alizarine.

Not only does alizarine give lakes, but also purpurine, extract of logwood, and several other colouring substances. When these colouring substances are dissolved in alkalies it is a fact well known to dyers that the acetate of alumina, of iron, of tin, and also of chrome alum, give precipitates the colour of which is red-brown and even black.

Mr. Johnson affirms that alizarine precipitated by alum or the salts of zinc renders the gelatine insoluble or colours the transfer paper. Permit me to deny the truth of this assertion. Yes; perhaps if the alizarine be dissolved in ammonia, and if it be precipitated by an excess of alum, as indicated by Mr. Johnson, the fact is possible, because the precipitate retains an enormous quantity of alum.

But there exists in trade much more practical means; among others, that which consists in adding, by degrees, the acetate of alumina to the boiling solution of alizarine. There exists means much more simple, but I believe I ought not to divulge them here. At any rate, I am profoundly astonished that an observer so distinguished as Mr. Johnson is has not noticed that alizarine does not give colours unalterable by the action of light if in combination with bichromate of potash. In the silk dye-works at Lyons the fact is well known.

I discovered some time ago certain colours much more stable than those obtained from madder, and especially more stable than those from cochineal. This last substance was only used by me at the very commencement of my manufacture of carbon tissue.

In order that there may be no dispute about my employment of the colours designated by Mr. Johnson, I enclose to the Editors some dry samples, and it will be seen at once that they are absolutely of the same tint as my make of tissue, which is known by the name of "red chocolate." I have also enclosed a print which has been made upon this particular tissue.

I will make one more observation upon Mr. Johnson's patent. It is that last year I introduced commercially sheets of cardboard rendered insoluble by wax, paraffine, and stearine, with the intention of providing a substitute for Sawyer's flexible support. But the public has not been inclined to try them, glass having the preference.—I am, yours, &c.,

89, *Rue de l'Hôpital, Gand, Belgique,* D. van Monckhoven, *Dr.*
November 10, 1877.

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"RAPID EMULSIONS."

To the Editors.

Gentlemen,—In reply to Mr. John Vaughan's request in the last number of the Journal, I can only say I have nothing new to tell. The process I use is the bromide of zinc, *un*washed collodion, with *slight* excess of silver, without preservative and without substratum, unless a slight polish with powdered talc can be called a substratum.

Perhaps my plan of correcting the emulsion may from its simplicity be of use to some:—For four ounces of emulsion take three and a-half ounces of the bromised collodion, and add to it in the usual way the silver for four ounces. This will *ripen* rapidly and soon pass into the foggy stage. Then add the other half-ounce of collodion, a little at a time, testing till the fog *just* disappears, when it will be in the most sensitive state.

In developing I use a modification of Newton's sal. soda formula; and here, again, my aim has been simplicity:—

Common washing soda	1	ounce.
Bromide of ammonium	25	grains.
Strong liquor ammonia	¼	ounce.
Water	8	ounces.

Flow over sufficient to cover the plate; add to it a little dry pyro. and flow again, when the image will rapidly appear; add a *little* more pyro. if needed, and wash off *directly all the detail is out.* Fix, wash, and dry. If not intense enough when dry, moisten it under the tap and proceed to intensify with pyro. and silver, when (at least with my plates) any amount of intensity can be obtained.

The plates I am now preparing are more sensitive than wet, and much easier to develope. I send you four quarter-plates. Please try them, and, if you think it worth while, inform your readers of the result; only I would ask you to keep close to the foregoing instructions for development.

The 8 × 5 print I sent you of the yachts in Dover harbour I consider under-exposed, and the negative needed forcing in development. The yachts were swaying to and fro with the tide, and to get them and the distant cliffs both into focus I had to use the stop $\frac{f}{22}$. I hardly expected it to turn out so well, but thought I would try a plate. Perhaps the Editors will say if the print does not bear upon its face the proof of the rapidity claimed for it.—I am, yours, &c.,

13, *Calverley-street, Tunbridge Wells,* H. G. Inskipp.
November 13, 1877.

[The print certainly does bear evidence of the great rapidity of exposure.—Eds.]

AUXILIARY LIGHTING.

To the Editors.

Gentlemen,—When I read, through the medium of your Journal, that Signor Scotellari, of continental reputation, was in our country to demonstrate the application of violet light in after-lighting, and to show the advantages in the use of his chemical preparations, I felt very much interested.

Last week Signor Scotellari paid me a visit, and experiments with his patented "*opturateur sensible*" or lens-cap were conducted in the following manner:—The half of a double plate was exposed fourteen seconds with the usual cap; the other half, under the same conditions, was only exposed seven seconds, and after the sitter had left his position an after-exposure of four seconds through the violet medium took place.

The negatives produced in this manner were developed, fixed, and printed without retouching by my assistants in the ordinary way; and I must confess my astonishment to find on the following day that none of the prints obtained by Signor Scotellari's process in half the time were inferior to those produced by our ordinary *modus operandi.* Thus our experiment proved very successful by gaining fifty per cent. on the usual exposure.—I am, yours, &c., Lombardi.

Brighton, November 13, 1877.

DETERIORATION OF SENSITIVE PLATES.

To the Editors.

Gentlemen,—While I am sorry that I can give "R. A. R." no information about his plates, either as to the cause or cure, I may say that I have carried many dozen plates from home—emulsion and other processes—packed in precisely the same manner, but have never experienced what he complains of.

Certainly that portion of the plate covered by the india-rubber bands may be sacrificed, but it is only about the eighth of an inch at each end; still even this is not necessarily sacrificed, for I have just examined some prints which were printed to the *full* size of the plate, and even that portion which had been covered by the bands was barely noticeable.

I am of opinion that "R. A. R." must look beyond the bands in the search for the cause of his failure.—I am, yours, &c., J. C.

Edinburgh, November 12, 1877.

SPOTS ON EMULSIONS.

To the Editors.

Gentlemen,—Really Mr. W. Brooks must have a very poor opinion of the wits of amateurs in general, myself among the number. Only fancy using a wet-plate slide for dry plates—a slide, moreover, which has been set aside and then used without careful cleaning (a rather doubtful process); and, after all, wondering "what is the cause of these spots!" What idiots we must be!

But suppose we use slides which have never contained a wet plate, and yet spots appear in the skies of the negatives—not merely at the lower end of the plates, but exactly up to the sky line. What can be the cause of spots such as these?

If Mr. J. Dudley Radcliffe's hypothesis be inadmissible—which I believe it to be for this particular appearance, unless he can bring forward further proof that silver nitrate is capable of the anomalous behaviour he mentions—we can only suppose that, as the Editors suggest, the spots are produced by some body which is not reducible by the alkaline developer, and that they are the result of an intensifying action of that body on the exposed parts. According to this theory the spots are really present on the landscape portion of the negative, but escape detection owing to the naturally uneven tint, or broken-up character, of that part of the negative. I consider the Editors' theory the best which has yet been brought forward to account for this particular phase of spot, for doubtless there are "spots *and* spots."

I agree with Mr. Brooks in condemning any india-rubber but the purest. On one occasion I tried to keep some washed plates in the wet condition by placing them in a box made water-tight by means of ordinary black sheet rubber, and, in the course of a day or two, black specks became plentiful. This effect I believe to be due to the propagation of germs. I rather doubt whether the use of india-rubber water bottles is advisable for storing water for more than a few hours.

You invite attention to the physical peculiarity of a certain class of emulsion film, which, on being rubbed, exhibits a change in colour, invariably tending to orange or red. As the result of various experiments I have made, I have not any doubt that the colour transmitted by a film depends largely upon the state of division of the silver bromide; and my belief is that by the action of passing the finger over the film a finer silver bromide is produced, and that the parts which are most affected are those which exhibit the richest tints. We seem to have a somewhat parallel case in that peculiar property of the yellow iodide of lead which on the slightest touch becomes of an intense red colour.

It would be an interesting experiment to take an emulsion which transmits bluish-green rays and subject it, in a closed and suitable vessel, to the grinding action of some smooth and heavy body incapable of having any action on the emulsion. I have not much doubt that if the action were continued by machinery for some time—perhaps for days—the resulting emulsion would exhibit a marked change of colour towards the less refrangible end of the spectrum. The bromide would also, I think, be found to be less sensitive than before—a result which would probably be due to its being more effectually locked up in the film, and not to the effect it would have on the transmitted rays.—I am, yours, &c., Herbert B. Berkeley.

31, *Grove Place, Brompton, S. W., November* 10, 1877.

[On this subject Mr. J. W. Newall also writes:—"*Apropos* of Mr. Brooks's communication in your last issue I may observe that my dry-plate slide has never had an ordinary wet plate in it, and yet, when I do get spots (fortunately not often), they appear mostly in the sky. On the whole I agree with Mr. Brooks as to the cause of spots. Great cleanliness and quietness (to avoid raising dust) and moderately rapid drying I find almost always give me clean plates—cleaner, decidedly, on the whole than those I buy."]

A Model Catalogue.—At the exhibition of graphic art, recently held in Nürnberg, each visitor received, upon entering, a catalogue of which we are told that it was a work of art, illustrated by a specimen of every kind of printing that was shown in the exhibition, and the processes exhibited there in active operation appear to have been very numerous. No exhibition (says Dr. Vogel) has ever before been provided with such a catalogue, which was illustrated by an Aubeldruck; by views of Nürnberg by Hahn, Biede, and Schmidt; by *genre* pictures by Leyde and Muschler; by views by Pruden and other artists of Nürnberg; by a relief print by Bruckmann of Munich; by a lichtdruck by Arnold and Zettler; and by quite a variety of pictures by other and non-photographic processes, such as steel and copperplate engraving, wood engraving, and lithography.

Herr von Stefanowski on Photometers and Carbon Tissue.—In the *Correspondz* there is a rather lengthy article, by Herr von Stefanowski, on the advantages and disadvantages of different sorts of photometers, in the course of which he remarks that he thinks Dr. Vogel is mistaken in saying that an old bichromate bath is unsuited for the preparation of photometer papers, and that either a special or a freshly-prepared bichromate solution should be used. This idea Herr Stefanowski combats upon what appears to be the reasonable ground that an equal sensibility to light of the two factors—that is, of the tissue and photometer strips—is desirable, and that it may be best attained by sensitising both in the same bath. Herr Stefanowski also refers to another difficulty he has encountered in carbon printing:—Given a certain negative, and supposing it to be determined that printed in the shade a carbon print will be ready on the eighteenth degree of the photometer scale becoming visible, one would be apt to conclude that if printed in the sun the eighteenth degree of the photometer would then also indicate that the carbon print was ready. This, Herr Stefanowski says, would not be the case; the carbon print would be a good deal under-exposed, because the photometer paper, whether sensitised with silver or bichromate, prints much more rapidly in the sun than in the shade, and the rapidity of printing of the carbon tissue is not affected to the same comparative degree. A good precaution against under-printing in such cases would be, when noting the printing number on the end of a negative for future reference, to add whether the number referred to printing in the sun or shade, by having a given sign to indicaie each—as S for sun and + for shade, so that a negative might be marked S 22, 18+. In their published remarks, Dr. Liesegang's observations agree with those of Herr Stefanowski with reference to the varying sensitiveness of tissue and photometer in sun and shade, while those of Dr. Monckhoven point to conclusions exactly the reverse—a circumstance which Herr von Stefanowski thinks may be attributable to some pecularity of Dr. Monckhoven's tissue or photometer. A further peculiarity of the carbon process that has troubled Herr von Stefanowski is the after-action of the light, as seen both on the photometer strips and the prints. Thus, a photometer showing the number 14 on the scale, if left all night in the dark room would show next morning the number 18, and a fully-printed picture would have become too dark; so that in printing one would have to consider whether the picture would be developed at once or not for some time, making allowance for the probable darkening in the interval. By leaving a picture which had been too soon removed from the printing-frame in a dry and undeveloped condition it might be brought to the proper depth.

EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale*, that being done at a small cost in our advertising pages. This portion of our columns is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

Wanted, a cabinet-size scenograph. Exchange offered in photographic apparatus and other articles.—Address, Fred. Daking, Bramford-road, Ipswich.

Weston's cabinet burnisher, cost £5, and Francis' printing press with large quantity of type, cost over £5, will be exchanged for a pair of Dallmeyer's 1B lenses or a 2B lens, or either for a Kinnear camera not less than 10 × 8.—Address, J. D. L., Athenæum, Bristol.

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ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

Notice.—Each correspondent is required to enclose his name and address although not necessarily for publication. Communications may, when thought desirable, appear under a *nom de plume* as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications

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Lieut. Lysaght.—We shall write privately.

X. Y. Z.—Thanks; we shall make use of the information in an early number.

R. S.—None of the engravings mentioned are copyright, and hence you are at liberty to copy them without infringing any rights.

Gum-Gallic.—If you look again at the article you will see that it was translated from a German periodical, and, moreover, that it bears the name of the author.

Geo. Mitchell.—By using a fifty- or sixty-grain bath upon which to sensitise the paper, you will not again experience the annoyance of the albumen becoming dissolved off the paper.

Obliged Reader.—Neither of the samples of glass enclosed are properly adapted for glazing the window of the dark room. There is a deep ruby glass which is highly suitable for this purpose.

F. T. W. P.—The term "oxycalcium" light is usually employed to designate a light obtained by the agency of a spirit lamp, a stream of oxygen being passed through such a flame, and made to impinge upon a piece of lime.

W. W.—Try the following proportions:—Iodide of potassium, nine grains; bromide of potassium, six grains; chloride of sodium, two grains. The same quantities and proportions of all the other materials may be employed.

C. Mitchell.—There is no way by which the bath-holder can be mended other than by the agency of powerful clamps. It will be advantageous to apply a solution of asphaltum in benzole along the crack previous to putting on the clamps.

A Printer.—Filter the gelatine before using, and you will never again experience such defects. Filters for the purpose are supplied by Messrs. R. R. Whitehead and Brothers, Limited, Endell-street, successors to the Wandle Felt Company.

Argus.—The most that we can say at present is that the *subject* seems a most attractive one. Without fuller particulars of manipulation it is quite impossible to indicate in what respect fault is to be found. As a *photograph* the specimen is very unsatisfactory.

J. M. N.—Oyster-shell markings being so intimately associated with hot weather, we are somewhat surprised at the statement of your experience with them during the past fortnight. We are glad, however, that, profiting by our article on the subject, the evil has been overcome.

S. G. S.—We are aware of an application for a patent having been made nine years ago for an alleged invention similar to yours; but we are also aware that it was considered by the patent authorities to be so worthless that they declined to give it even provisional protection.

H. J. Palmer.—Our information respecting this matter is rather limited. In Cooley's *Cyclopædia*, the directions given are to dissolve the gelatine at a low degree of heat, and pour on the "cooling slabs" to the depth of about half-an-inch. When cold it is dried on nets.

J. B. Westerfield.—To render the south window permanently useful it will be requisite to give it a coating of some varnish that will convert it into the semblance of ground glass. A little fine whiting mixed up with very weak gum water will probably answer the purpose quite well if it be dabbed on in an even manner.

An Architect.—The triple achromatic lens is very far indeed from being bad or unsuited for the purpose specified; but the "rapid" lens of the same maker will be found to be still better adapted for the purpose, because, while it will define equally well, it will admit a greater volume of light, and thus enable an equally good picture to be taken with a much shorter exposure.

Metropolitan.—It is impossible, in the present state of our optical knowledge, to produce that which you desire, viz., a single lens with a stop in front, and which will give pictures free from distortion. In the other combination, which you represent in your (very imperfect) drawing as No. 2, the diaphragm ought to be placed much nearer to the front lens than it is shown by you.

C. F. C.—Such frames are sold by Messrs. Marion and Co., Soho-square.

Erratum.—By the transposition of a line in the list of medal awards published last week, we inadvertently made Mr. Durrant and Mr. England change places in respect of the medals for the best "instantaneous picture," and the best "frame of dry-plate photographs." We now rectify this by stating that Mr. Durrant was the producer of the *instantaneous*, and Mr. England of the *dry-plate*, photographs.

Tyro.—Carry the printing to such a degree of depth as to quite bury the details of the shadows. You must also sensitise the paper—not by floating it upon the surface of a solution of nitrate of silver, as usual, but by immersing it in the bath. Print deeply, fix in hyposulphite of soda as usual, omitting the toning, and, when dry, apply a solution of Canadian balsam in benzole, so as to render it translucent. It was in this manner that the transparency you admire was printed.

⁂ On account of the pressure on our space this week, we are obliged to defer till our next the promised article on Keevil's lantern, and also several reviews and other articles.

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Fire at Kingston.—A fire broke out on Sunday morning last, about eleven o'clock, at the business premises of Mr. Samuel Fry, photographer, 9, Surbiton Park-terrace, Kingston. Smoke was first seen to issue from the framing, mounting, and printing rooms immediately below the studio, situate at the back of the building, and overlooking Southsea-road. An alarm was raised, and the fire brigades of Kingston and Surbiton were quickly on the spot. Before they could get to work a strong south-west wind had fanned the flames, which laid hold of the studio and a picture gallery close by. The premises being unoccupied there was some difficulty in gaining admittance, but the firemen, once inside, directed their efforts to save the main building, towards which the fire was extending. In this they were successful; but the studio and adjacent rooms, which were destroyed, contained between 30,000 and 40,000 negatives, besides a large collection of choice photographs, all of which have perished, the damage being estimated at over £2,000. Mr. Fry had, with other members of the corporation, accompanied the new mayor to church, out of which he was summoned by a special messenger. The news, however, was soon spread among the congregation, many members of which also suddenly left the church.

Photography in Court.—Gardner *v.* Granville.—This was an action brought in the Lambeth County Court on Friday last, the 8th instant, before Mr. Pitt Taylor, judge. The plaintiff, a photographic artist, of Kennington, sued the defendant, described as an actor, to recover the sum of a guinea and a-half for the reproduction of a portrait in character from a lithograph. The plaintiff stated he was visited by the defendant, who said he was an American actor, and showed him a lithograph requesting him to copy it, which he did and sent it to the address given by the defendant. He sent an account with it at the same time. His porter, contrary to his instructions, left the portrait without payment of the money, and he (the plaintiff) not being able to obtain payment had recourse to the present action. In cross-examination the plaintiff said no price was fixed, but denied ever stating that he would do it for nothing if he were allowed to exhibit a copy outside his studio as an advertisement for himself. He did not consider the defendant's popularity sufficiently great for that, but was aware that many photographers gave sittings gratuitously to "celebrities" on condition of presenting them with copies, and assigning the copyright to the artist in return. The defendant, who conducted his own case in a very theatrical manner, continued his cross-examination still further, but was stopped by the judge for importing irrelevant matter into it. The plaintiff, being recalled, denied anything was said about non-payment, but no charge was fixed. The plaintiff's assistant corroborated the evidence of the former. The judge considered the plaintiff entitled to the amount he claimed, and judgment was therefore ordered in his favour accordingly.

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METEOROLOGICAL REPORT.

Observations taken at 406, Strand, by J. H. Steward, Optician

For the Week ending November 14, 1877.

These Observations are Taken at 8.30 a.m.

Nov.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks
8	29·82	W	47	49	58	46	Hazy
9	29·66	SW	52	53	57	47	Raining
10	29·40	W	48	51	57	47	Fine
12	28·98	SW	42	46	52	41	Cloudy
13	29·33	W	46	47	48	43	Foggy
14	30·00	NW	38	38	51	36	Foggy

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 916. Vol. XXIV.—NOVEMBER 23, 1877.

DEVELOPMENT BY MEANS OF PYRO. OR ALKALI ALONE.

In connection with the subject of alkaline emulsions we mentionsd the peculiar behaviour of one sample under the action of the developer, the principal feature in the case being its capability of producing a satisfactory image with pyro. alone, but not with pyro. and ammonia. In a minor degree the emulsion is remarkable as being the first washed one which has come under our notice which, prepared with soluble bromide in excess and without the addition of any foreign matter to the finished emulsion, has exhibited this capability of development under the action of plain pyro.

Of course we are aware that in many cases this mode of development is not only possible but is recommended to be adopted, as it affords an opportunity of judging at the outset whether the exposure of the plate be correct or not. Many writers on the subject of development, while recommending this particular mode of procedure, omit to state that, though it may be perfectly feasible with the class of plates they themselves use, it will in a great many cases be found a failure; or, if any developing action be set up, it is so slow and feeble as to be quite impracticable. We propose, then, to say a few words upon the causes which bring about this difference in the behaviour of various plates under the action of plain pyro. as well as alkali alone.

For our first examples of the developing power of plain pyro. we may go back as far as the earliest days of dry-plate processes; the Taupenôt and various modifications of collodio-albumen, honey, gelatine, rosin, tannin, and indeed any process in which the silver bath plays its part, will be found to exhibit this power of, as we may term it, optional development—optional, because the first application of plain pyro. may be followed by either alkali or acid silver, as the circumstances of the case may seem to dictate. On the other hand, when the collodio-bromide process was introduced plain pyro. ceased to exert any action unless in exceptional cases where the exposure happened to be extremely prolonged, or, as in the case of interiors, where portions of the picture were much more strongly lighted than the rest. Under such conditions it occasionally happened that an image was producible with pyro. alone; but, as under similar circumstances it was no infrequent occurrence to find a visible image already formed without any development, such instances may be set on one side as entirely abnormal and not properly connected with development. We may add that we have met with cases in which, though no image was visible upon the removal of the plate from the slide, the mere moistening of the surface was sufficient to bring out the sky or high lights; or the same effect would ensue if the plate were allowed to remain undeveloped for some hours, showing that a developing action of some sort was set up in the film itself.

The property of development with plain pyro., though rarely met with in connection with collodio-bromide plates, is by no means uncommon with plates prepared in the bath or with some of the more modern descriptions of emulsion. It seems reasonable to suppose that the difference in developing power is due to the action of free silver upon the constituents of the film, either in the state of solution—as when the bath is employed—or in the form of an excess of the salt in emulsion. It is, perhaps, beyond our province to inquire more minutely into the precise action of the silver in bringing about this result; but we may suggest two possible explanations:—First, the formation of a silver compound capable of spontaneous reduction—*i.e.*, self development—when acted upon by light; or, secondly, a compound which, from its richness in silver, is reduced by light to a state in which its molecules have so feeble an affinity as to be easily acted upon by pyro. alone. The first of these theories is supported by the phenomena of self-development of over-exposed films quoted above, and also by the fact that plates prepared with an excess of silver, but containing no such excess at the time of exposure, produce a much denser image by mere exposure to light—that is, by direct printing—than similar films on which free silver has not been permitted to act. The fact that a plate which has received an ordinary exposure will remain for months in a state capable of producing an image under development, but, at the same time, showing no visible impression, argues against the self-development theory. The truth may probably be midway between the two theories; or, in other words, they may be different degrees of the same effect.

The same classes of plates of which we have already spoken exhibit also a tendency under certain circumstances to development by means of alkali alone without any addition of pyrogallic acid. The developing action in this instance would seem to be identical with the effect produced by plain pyro., its absence in any case being dependent upon the restraining action of the organifier employed. Thus, a bath plate, or one prepared from an emulsion containing excess of silver, if washed until the free silver is removed and dried without the application of an organifier, will almost invariably exhibit the power of producing an image with alkali alone. If, however, a number of plates similarly prepared be treated with various organifiers, the results, in respect of development, will be found greatly modified. Albumen and various forms of saccharine matter appear to reduce or altogether arrest development; gelatine and gum arabic exert but little influence; while coffee, gallic, and pyrogallic acids increase it. Tannin behaves in a somewhat anomalous manner—in some cases arresting, in others increasing, the action of the alkali. If the solution of tannin be comparatively weak—not exceeding four or five grains to the ounce—the effect will be augmented; but, as the strength of the organifier is raised, so in inverse proportion will the action of the developer be decreased, until at ten or twelve grains to the ounce the effect is altogether lost. This difference we can only explain by looking at the peculiar nature of the substance. Tannin, as is well known, is a reducing and developing agent, but it is also known to exert a powerful restraining or retarding action when employed as a preservative; and we must suppose that its restraining power increases disproportionately to its reducing action, so that while in a weak solution the latter predominates, we may, by increasing the strength, reverse the order of things and bring the former into force.

So far we have confined ourselves to the behaviour of films in which free silver has played its part in the formation of the sensitive compound; let us now turn to those forms in which the silver bromide is at no time subjected to the action of excess of nitrate. In this class of plates, comprising the simpler forms of emulsions, the developing action, if any, of plain solutions of either pyro. or alkali will be found to depend invariably upon some action of the organifier, whether applied to the film or added to the emulsion, or to some peculiarity in the treatment of the emulsion or plates during preparation. In the case of the emulsion quoted last week the inducing cause was palpably the addition of ammonia, which, though ultimately neutralised before precipitating the emulsion, had exercised its special action on the silver bromide during the brief period it was present in the free state. Fuming with ammonia previous to exposure has long been known to confer upon certain forms of dry plates the power of self-development, brought about by the combined action of the alkali and the perservative.

It is not, perhaps, so well known that ammonia fuming renders possible the development with pyro. alone of plates not otherwise amenable to such treatment—that is to say, those which have not undergone the action of free silver. The application of an alkali in some form during the preparation of the plate is, indeed, the only means with which we are acquainted by which such plates are brought within the action of plain pyro., though an emulsion bromised with ammonium alone will, under some circumstances, which we are unable to explain, produce a similar result, yet in an irregular and eccentric fashion.

The power of development with alkali alone is more commonly met with in connection with emulsion prepared with excess of soluble bromide. In this case the developing action, where it exists, is set up by the combination between the alkali and the organic agent employed as a preservative, and is almost equivalent to the ordinary development by alkaline pyro., only that the two elements instead of being used together are contained—the one in the film, the other in the developer. The precise effect obtained depends, of course, upon the character of the organifier employed; these behave in this respect in a similar manner to that already noted in an earlier portion of the present article.

It must be fully understood that, in speaking of development by means of either pyro. or alkaline alone, we do not imply a full or complete effect, such as may be obtained when both are used. At the best the result is only a feeble image, possibly complete in all its detail, but requiring intensification in order to render the result available for printing purposes; in the majority of cases, however, it does not attain that stage, in many, producing only the highest lights. Where the result is such as to produce a feeble image complete in all its detail the method is worthy of adoption, as it enables a judgment to be formed of the exposure of the plate and the treatment it is likely to require, without endangering the safety of the negative should the exposure not be exactly correct, as is frequently done when a developer of full power is used at first.

To secure this assistance, then, in the case of plates which are not otherwise capable of development with pyro. alone, it is only necessary to expose them for a few minutes, when dried, to the action of fumes of ammonia. We recommend that they be permitted to dry before this treatment, because, though not liable to discolouration in the same manner as sensitive paper if exposed moist, the action upon the dry film will be more uniform. Due regard must be paid at the same time to the organifier employed, as it will not do to use one which will either neutralise the effect of the ammonia or set up incipient development immediately upon exposure. Pyro. especially must be used with caution, owing to its tendency, in combination with the alkali, to produce fog.

In a different direction, Lieutenant Plucker, a member of the Belgian Photographic Association, published some two years ago a method by which he avails himself of the power of ammonia alone to effect the first stage of the development of his dry plates. By his method the plates after exposure are slightly moistened by breathing upon them, and submitted to the action of ammonia vapour until the image appears. No details were given by M. Plucker of the process by which he prepares his plates, but, by adopting emulsion plates prepared with a slight excess of silver and a coffee preservative, we were enabled to obtain very good results. The advantage of this plan rests in the power it gives to develope while travelling without the trouble of bottles and solutions.

THE APPARATUS AT THE RECENT PHOTOGRAPHIC EXHIBITION.

We have already expressed our opinion respecting the excellent quality of the apparatus shown during the recent exhibition of the Photographic Society of Great Britain. If any soreness be felt by the exhibitors as regards the withholding of medals for such productions, they will doubtless find consolation in the fact that in no previous exhibition have the medal awards, both as respects omission and commission, given more dissatisfaction than those in connection with the recent exhibition. This fact is being repeatedly forced upon our notice from various sources.

There was a portable and highly-ingenious camera, devised by Mr. W. B. Woodbury, which received much attention. Its chief features are these—that its packing case, a neat mahogany box when closed, is in reality part and parcel of the camera, which has a bellows body, and is capable of every kind of adjustment. We shall at present refrain from giving descriptive details of this camera as Mr. Woodbury has obtained a patent for it, the specification of which we shall procure and publish as soon as the requirements of the patent law and the dormant energies of the Patent Office permit us to do so.

The largest exhibitor in this department was Mr. George Hare. He exhibited his most recent production in the way of changing-box and slide. Since we last referred to these Mr. Hare has so modified the internal economy of his box that fifteen plates are now accommodated in the same space that twelve plates previously occupied. This gain has been secured without the sacrifice of any pre-existing good quality whatever—a fact of which we have satisfied ourselves by a tentative examination. In one of Mr. Hare's bellows cameras for 7½ × 5 plates lightness and rigidity were very happily combined, the focussing being effected by means of a rack and pinion. It had a sliding extension in front, by means of which a lens of fifteen inches might be used with it, and this, too, without the slightest sacrifice of rigidity. A swing-back and the ordinary adjustments in the front completed the fittings of a well-designed and well-made portable camera. This maker also exhibited an ingenious graphoscope, with revolving "album," for stereoscopic slides. By rotating this album one of a series of views contained therein was presented to the view of the spectator at every semi-revolution. This, and two other albums of a similar description, containing respectively *carte* portraits and cabinet landscapes, also by Mr. Hare, were continually being rotated by the visitors, many of whom were loud in the expression of their wonder as to how the changes could be effected by such simple maniplation. The workmanship was of the highest class of excellence.

KEEVIL'S DUPLEX LANTERN.

During the past week Keevil's new lantern has made its first appearance on a London stage, having been exhibited and tried by Mr. F. York at the Technical Exhibition of the South London Photographic Society, held at the House of the Society of Arts. The instrument there achieved all the success we have predicted for it; and, as we believe it to be a lantern that cannot fail to be more and more appreciated in the future, we shall commence the present article—which will necessarily be of a more practical and descriptive character than our former one—by giving a general idea of its construction.

When we were first shown the lantern—at that time in a scarcely completed form—we gave, at the beginning of September last, after a cursory inspection, such an account of it [*ante*, page 434] as sufficed to render clear the general principle involved in its fabrication. It was, we observed, a means by which one light was rendered applicable to two lanterns, so as to produce dissolving views without the necessity for having a second light. We further explained that this was effected by having two lenticular systems fitted to one lantern, each being nearly at a right angle to the other, and the one light common to both systems; while a prism was connected with one of them for the purpose of reflecting the whole of the emergent rays so as to cause them to fall upon the same screen, to which the rays from the other half of the optical system passed without interruption. We are now in a position to speak more critically of the new instrument.

When a lantern disc is shown upon a screen, after the whole of the rays have been reflected by means of a prism or mirror, it stands to reason that the disc will be less luminous than if the projection had been made *direct*—that is, without the intervention of the reflector. This objection is quite valid when urged against the perfect equality of two discs—one of which is projected through the prism, the other being direct. But a question may here arise as to the equality of the discs shown by the lantern in question, in which these disturbing conditions are present. We reply, in the first place, by asserting as a mere matter of fact that the two discs are equally illuminated. Before proceeding to show in what manner this is accomplished, we observe that the loss of light from reflection is far less than is generally imagined; so much is this so in the case to which we are now referring that, even without having recourse to any compensating influence, it is doubtful if one out of six spectators could discover that there was any difference at all in the intensity of the illumination of the respective discs. Mr. Keevil, however, solves any difficulty existing on this score by adjusting the power of the condensers in such a manner as to make one of them transmit a greater angle of light, so as to perfectly compensate for the loss caused by the use of the rectangular prism or reflector. To effect this it is only necessary to give a greater degree of curvature to the lens nearest the light, or, if retaining the same curve, to construct it of glass of a slightly-increased density, so that it may be brought a very little nearer to the line than the other condenser. This is the whole secret of equality of illumination, and Mr. Keevil has carried it into effect in a manner which is perfectly satisfactory.

We here note what Canon Beechey has written on the subject of the apparent impossibility of illuminating the two condensers equally, and observe that the objection he makes is one which, till we saw the lantern tried at the meeting to which we have alluded, we had also entertained even more strongly than Canon Beechey possibly could have done. But we had considered that in the exhibition of dissolving views it was not by any means necessary that such condition should exist; it was enough, we thought, that only one disc should be illuminated at a time, as this supplied all the conditions really necessary. If both discs *could* be illuminated equally at the same time it would undoubtedly be a valuable acquisition to the powers of the lantern, because what are known as "effects" could then be introduced. By "effects," we may explain, are meant the introduction, in connection with the picture thrown on the screen, of something appropriate to the scene by means of a second lantern. For example: a child is seen sleeping on its couch; slowly a guardian angel, projected on the screen from the second lantern, is seen beside the couch watching over the sleeper. Or a cathedral is first seen by day, then twilight supervenes, snow is seen to fall, night sets in and the windows become illuminated, the moon rises and the lights are extinguished, the advance of daylight showing a snowy, wintry scene of a character altogether different from that with which the series opened, although with the same edifice. Exhibitions of this kind are conducted with a series of "effects," for the first conception of which we are indebted to Daguerre, and for their being successfully carried out we are compelled to lay photography under contribution. This, we then believed, was the point at which must be estimated the capabilities of the duplex lantern, and beyond which it could not possibly advance; for, like Canon Beechey, we considered that the angle of illumination from a lime cylinder was too small to illuminate the two discs simultaneously. But, as if to show the futility of this fancied objection, almost the first thing done by Mr. York, on the evening in question, was to show *both* discs equally illuminated, which he did by directing the axis of the light (if such a term be permissible) to a point midway between both condensers, the angle of illumination being then sufficient for the two discs; and by removing the fans from both objectives, and covering each alternately with his hand, he showed that one was equal to the other, following this up by exhibiting one of the very "effects" we have just described, namely, the "guardian angel" scene from *Jane Conquest.*

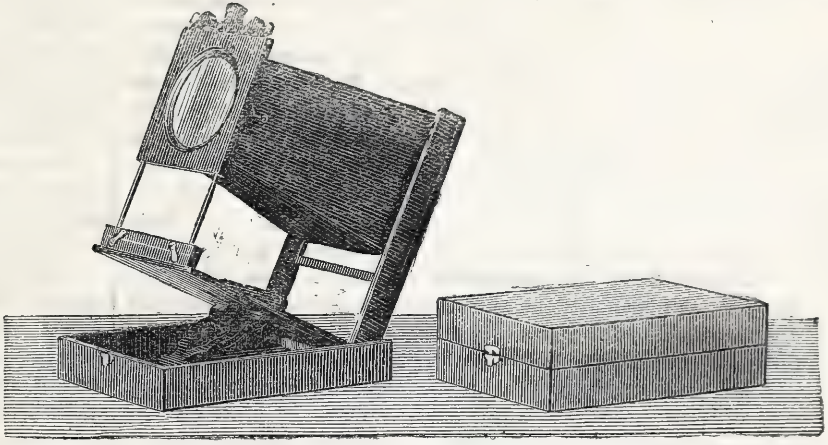
The dissolving is managed with facility. Instead of turning the oxygen tap, as in ordinary dissolving lanterns, so as to divert that all-important and rather expensive gas from one lamp to the other in this case a projection from the burner is merely pushed slowly from one side of the lantern to the other, and by this act two fans in the front of the objectives are manipulated, the one being made to cover while the other uncovers the respective object-glasses. The light also, by this act, is made to point more directly towards the picture which is being exhibited on the screen.

Excellent judgment has been shown in constructing the "duplex lantern" (the name by which it is to be henceforth known) of such dimensions as to allow its packing case to be stowed away inside of Young's oxygen generator.

THE PHOTOSCOPE.

Under the above title Mr. William Brooks exhibited at the Technical Exhibition of the South London Photographic Society a graphoscope which, from its construction, was capable of doing double service, namely, as an instrument for examining photographs both by reflected and transmitted light.

The annexed diagram shows the instrument both when packed up and opened out for use. As will be seen, it consists of a large lens through which the picture is to be viewed, and an opaque cone at the farther end of which is an aperture in which to slide the transparencies. This cone is easily removable, and the apparatus then becomes an ordinary graphoscope. It is of French manufacture; but, if we recollect aright, a similar apparatus was introduced several years since by Mr. Rowsell, the inventor of the graphoscope.



ALIZARINE.

The remarkable and increasing prominence which carbon printing is daily attaining is shown by the continual flow of communications upon its various phases to which our pages bear constant witness. It is well known that when, as in its original form, carbon alone was used as the colouring addition to the gelatine the finished prints possessed an unpleasant greenish tint, which was soon found to be undesirable and unpopular, and many substances have since been used either to supplant the carbon or to ameliorate its tone when added to it in the tissue. Various pigments have been employed—some of such a nature as seriously to mar for a time the reputation for permanency through the fugitiveness of their colour. Among these have been aniline dyes and cochineal colours—most of the former, it is well known, being highly fugitive, and the latter only a few degrees less so. But, as Mr. Johnson's patent specification and Dr. van Monckhoven's letter will show, another agent has been the subject of experiment, and is likely to occupy a prominent position among the pigments used for making tissue. The substance we allude to is alizarine, which promises to be one of vast importance in the new photography, as we may call carbon printing, and has of late years become one of the most interesting of products known to chemists of the present day.

For a long time madder has been known as a substance (of vegetable origin) capable of giving dyes of great value, owing to their beauty and permanency. The various chemical principles it contained were long the subject of investigation by chemists, and their researches resulted in the isolation of several compounds new to science, chief of which were alizarine and purpurine. Madder was employed for various shades of reds and purples, and one of the chief difficulties of the dyer was the preservation of the beauty and brilliancy of the tints he obtained—Turkey red being a conspicuous example of difficulties overcome, originally by means of a most protracted series of operations, which more lately, however, have been much simplified. Upon the isolation of the principles named a fresh impetus was given to dyeing with madder, tints still more beautiful being obtained.

The extraction of alizarine in a state of purity was a work of considerable difficulty—so much so, indeed, that for some time the actual formula representing its composition was matter of discussion; but a very few years ago it was solved in a manner which alone is a trophy of the scientific thought of this century. The investigations connected with the synthesis and analysis of its allied compounds resulted, by the aid of a bold conception in the production for the first time in the history of chemistry, of a vegetable colouring matter by artificial means.

Briefly it was as follows:—There is a class of compounds known as "quinones," and in investigating them Graebe, a German chemist, ascertained the composition of a body not unlike alizarine which had been known for some years. It was derived from naphthaline, and by heating with zinc dust naphthaline was reproduced from it. From various analogies he was led to heat madder alizarine, and this was converted into a well-known substance called "anthracene," which is usually obtained from coal tar. Drawing the inference that the relationship between these compounds pointed to the probability of the similar treatment of anthracene leading to the production of alizarine, he tried the process, with the result of obtaining from a gas-tar product the coloured principle, one of the most valuable dye-stuffs. In the process bromine was employed, and the new product was in consequence too dear to compete effectively with the old one; but very shortly a means of substituting sulphuric acid in place of bromine was discovered, and now the manufacture is one of the most important of the day among dye manufacturers. Already it has caused the importation of madder to be most materially reduced, with the necessary consequence of a reduction in the price.

This artificial alizarine, as supplied to the dyer and printer, is not pure, and its colour with alumina salts is redder than madder colours, owing, it has been said, to the presence of purpurine; but this is evidently an error, as Dr. Schunk has proved.

The exact shade it is capable of taking will be a matter of considerable importance in pigment printing, and, according to Perkins, this quality is under the control of the manufacturer to a considerable extent. For instance: alterations in the temperature cause a difference in the shades of colour. Some doubt has been thrown upon the product obtained as explained above being truly identical with alizarine; but, according to the authority just named, there is no doubt as to its resemblance, seeing that to every known test it behaves in an identical manner with the alizarine extracted from the madder itself. This material, as first produced, and in a condition obtainable in commerce under the name of "alizarine," is by no means a pure product, it being contaminated with various compounds injurious to the production of the brightest colours. A method recommended by Auerbach is to dissolve the crude product in caustic soda, and then pass carbonic acid through the solution. A precipitate composed variously of alizarine and soda combined in various ways is produced. This precipitate, after being washed, is decomposed with an acid, when fine orange coloured flocks are obtained, which dissolve in caustic soda with a blue tint.

When alizarine is used for dyeing Turkey red the usual process is to subject the fabric to the process of oiling, then to treat it with alumina, and, finally, the colouring matter is applied. By the new method the first and last operations are combined, the alizarine being dissolved with the aid of soap, and sulphuric acid being added to neutrality. The alizarine then separates in combination with fatty acids, very permanent and brilliant colours being produced. There would seem to be here the germs of a process which might be made use of in pigment printing by autotype; but the scope of the present article is more especially to put our readers in possession of facts relative to alizarine, so that each may, if he think fit, institute experiments on his own account.

With regard to its properties, its solubility, and its action with various reagents, the following notes will be received with interest:—It can be sublimed without change, and in the anhydrous state forms prismatic crystals or shades between orange and red. With water in combination it forms gold-like crystals. It is very slightly soluble in water, even when boiling, but is soluble in alcohol and ether. It is soluble in hydrochloric acid, with a brown colour in sulphuric acid, and is thrown down by water from the latter solution. In caustic soda, potassa, and ammonia it is soluble with a deep purple colour, and is precipitated from these solutions by acids.

Alumina throws down the alizarine from its alcoholic solutions in the form of a beautiful red lake; and a precipitate is likewise given in solutions of alizarine in ammonia by various metallic salts—magnesium, iron, copper, silver, &c. These precipitates are known under the name of "lakes," the term being applied to precipitates of colouring matters by means of earthy or metallic oxides. It is these lakes which are of more especial interest to photographers, they, so far, being the form in which alizarine has been recommended to be employed.

There are few vegetable colouring matters which cannot be precipitated in this manner to form lakes of more or less beauty, from yellow to purple; but, fortunately, experience with all their varieties has already been obtained by painters in water colour and oil, and the verdict of "fugitive" has been passed against all but the madder lakes. The beautiful crimson lake and still more beautiful carmine are prepared from cochineal, but are useless when permanency is required, as will be easily seen by referring to many an old miniature, where, in place of cherry lips and glowing carnations, we have cadaverous lines and shades of blue and green. We feel confident, however, that, in the hands of practical dyers and chemists, some compound of alizarine will be found which shall give us pigments to render our blacks as lasting as the most durable of the artist's palette. Beyond that we cannot ask more.

In our last number Mr. J. W. Leigh adds one more to the list of methods available for the reduction of silver residues to the metallic state, which, though scarcely practicable on a large scale, recommends itself specially to amateurs, who are not, as a rule, *au fait* in crucible operations. But while we speak favourably of this method on the whole, we would call attention to one or two points in which this and other similar modes of converting silver chloride into the state of nitrate require special care, in order to avoid serious trouble and even actual loss. First of all, it is important that the whole of the chloride be converted by the boiling with sugar and alkali. It is quite impossible to judge of the progress of this operation by merely watching it, and it is equally unsafe to trust to any rule of thumb means of deciding upon its completeness; but actual tests should be applied in order to ensure the thoroughness of the change. In this as in the kindred method (in which the sugar is omitted and the silver reduced to the state of oxide) a small quantity of the muddy-looking mixture should be placed upon a strip of glass, and a drop or two of nitric acid added, when if any part of it refuse to dissolve it is evident that the operation is still incomplete. Mr. Leigh's method is, we believe, much more rapid than the other we mention; the latter we know to be a very tedious operation, and apt to give very uncertain results. Upon one occasion, even after esting in the manner we have described, we found nearly twenty-ve per cent. of unconverted chloride remained after solution in nitric acid. The same objection—the difficulty of converting the whole of the chloride—may be urged against the zinc and copper methods; but a still greater one exists in the extreme care which is necessary, especially in the latter, in removing traces of the baser metal from the finely-divided silver previous to solution. Considering the tenacity with which silver holds to organic matter in ordinary processes, we should be inclined to look with some suspicion upon a sample of nitrate made in this manner until it had proved its character for purity. We do not suppose it would be so impure as to unfit it for printing purposes; but for the delicate purposes of negative work we fear it would require doctoring before use. Finally: while the process of Mr. Leigh is useful in the case of washings, &c., where it is necessary, from the weakness of the solutions, to recover the silver in the form of chloride, it is, we think, preferable when operating upon a bath or strong solution to precipitate directly with carbonate, and, after washing, redissolve in nitric acid.

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THE ART OF PAINTING ON THE PHOTOGRAPHIC IMAGE.

No. XII.

The drapery will now require attention. If it be black a warm grounding should be rubbed in, Indian red or burnt sienna being good. I once knew an artist who commenced his black draperies with cadmium yellow, and went to the extreme of grounding purple drapery with orange. It may be laid down as a rule that all, or nearly all, draperies should be painted on some warm ground, and this may be done in one of two ways, viz., either to model with this warm tint—that is, to indicate the lights and shades and chief folds; or else to be content with a flat, strongish tint all over where the drapery is intended to come. Green drapery may be grounded with yellow, purple with red, scarlet with orange, and so on, and there is no doubt a more brilliant and transparent effect, admired by the public, is secured in this way; still, in cases of hurry, they may be done at once, and some artists have habitually practised that method, amongst whom may especially be mentioned Horace Vernet, the French battle-scene painter.

If, then, time be pressing, drapery may be painted in one painting, and it is best to begin with the deepest shadows, using plenty of warm colour in the mixture. For black use black and burnt sienna, and no white. With this rapidly put in the deepest shadows (using a little sacrum), and painting them *rather too large*, so as to admit of the next shadow being swept into them, as it were. Do not use too small brushes, and for this purpose I think the flat brushes most decidedly preferable.

Now prepare a tint nearly as dark, but with a little white, as the last, and just enough raw umber to prevent a slatey or purple look, and paint in the next deep shadows. Note that it is better to paint *across* the shadows in a series of short strokes than lengthwise down the shadows, sweeping each touch a little into the dark; then mix other lighter tints. Until you get all covered in, and tolerably like the guide, use a little more raw umber with the lighter tints, but not sufficient to make them green.

In following your guide you need not exactly copy all you see. If a man's coat fit badly, for instance, or drags across the chest, take out the creases, and little separate shadows may sometimes be advantageously thrown into one.

In a lady's dress any awkward fold or angularity that spoils the figure may be removed, and a very thick waist hidden or altered. Sometimes women's figures look unaccountably worse in a photograph than they look themselves; indeed, some really look as though they had no more figure than a hat-rack, and no more bosom than a boarding-house chicken. To such be merciful and not too literal.

Occasionally you meet with a photograph in which the drapery seems equally lighted on both sides, or nearly so. The effect may here be helped a little by throwing the proper side into broad shadow or half-tone and the foreshortening of an arm, assisted by throwing the upper part into shadow and keeping it soft and vague, making the forward part sharp and bright. What I said about avoiding lines tells with terrible force in oil.

Look at a picture that your taste tells you is common looking. Examine it carefully, and try to find out the reason. If it be the drapery that is at fault ten to one you will find that the lapels of the coat and the sleeves and buttons are painfully lined and made out; or, perhaps, you will see that the artist has put one tint all over and then simply made out the shadows with black. Look at nature, and examine your guides. If they are *cartes* I would strongly recommend your glancing at them through a lens. I have found a paper or cardboard box of the greatest use—a box with top, bottom, and two sides, but the ends out.

Let the distance between your top and bottom be exactly that of a lens let into the top, a focal length of about three inches being convenient. The *carte* may then be simply laid in the bottom and the whole contrivance suspended by a thread fastened to a drawing-pin stuck in the top of the stretcher.

The advantages of this simple little instrument are manifold. It saves the *carte* from getting soiled, which is often of importance where the *carte* cannot be replaced and the subject dead; and this soiling is apt to occur where an artist has one hand engaged with his palette and the other with his brushes, while his forefingers and thumbs may not be quite free from paint. Another thing is that by adjusting the length of your string and the position of the pin at the top you may keep the picture on a level with your eye, and so close to the face, or whatever part of the picture you are at work at, as that a glance is readily obtainable without moving your head or eyes far. In this way the artist is enabled to see little bits of detail about the eyes and nose, &c., the sharpness or softness throughout, or in part of them, and many other things he would otherwise miss, and fill up all *unconsciously*, perhaps, "out of his head."

I have also often found that, when an artist has been working without inspection of his guide through a lens, has got into an awful muddle with his likeness, and is about to give up in despair, a sudden recollection of and the using his lens has landed him out of all his difficulties. Joseph Wake.

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ON THE FIXING OF NEGATIVE *CLICHÉS* OBTAINED BY M. CHARDON'S COLLODION BROMIDE OF SILVER EMULSION.*

[A communication to the Photographic Society of France.]

During an excursion of some weeks, in September last, I took with me about thirty plates, prepared with the collodion emulsion of bromide of silver after the formulæ of M. Chardon, and I take this opportunity to again state the great advantages of the process, as regards certainty of success and the simplicity of the manipulations.

As this mode of preparation appears to me to be that which will in the future replace nearly all the other processes of dry collodion, I consider it desirable to explain all the questions, faults, and accidents that may arise in its practice. Having encountered in the fixing of negatives some anomalies which surprised me I have searched for the causes, and after a considerable number of experiments, many of which had led me on a wrong tack and consequently to form erroneous conclusions, I believe myself to be able, this evening, to explain them in a satisfactory manner.

I have observed that, in general, negatives are fixed with much less difficulty by hyposulphite of soda immediately after development than if they are left to dry and then fixed afterwards; for I fixed my first series of negatives while still wet, and they do not present anything abnormal in their appearance. Negatives that had been developed and then dried, so as to be all fixed together later on, were quite different from the others; these I first washed with a plentiful supply of water, then passed them into a solution of hypo. at twenty per cent. until the disappearance of the whitish colour of bromide of silver, and, after washing, I left them to dry. To my great surprise I found them, when dry, to present the dull whitish and somewhat veiled appearance of a negative imperfectly fixed, and even a prolonged immersion in the hypo. bath did not make the deposit disappear.

I then thought—not without apparently some reason—that the film of collodion had become impermeable from its desiccation, which did not allow the fixing agent to penetrate sufficiently, and that a very thin film of bromide of silver escaped its action. I therefore employed more energetic fixing agents, but the result was identically the same. I persisted in my idea, notwithstanding, without, however, being able to understand why this opalescence disappeared while the film or "couch" was wet, and reappeared when it was dry. Its extreme thinness might be a sufficient reason. Thinking, then, that it was necessary to add a little more permeability to the collodion, so as to ensure its complete fixing, I washed a negative with alcohol at thirty-six degrees, as is done immediately before commencing the development, and the result was that the defect and opalescence had completely disappeared.

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* It is probable that these remarks may extend and apply to all processes where collodion which gives pulverulent films is employed.

I started from this trial, which appeared to me conclusive, to make several experiments, and I was enabled to assure myself that this opaline film did not retain the least sensibility to light, nor had it any effect on a subsequent reinforcement; for when I wished to intensify the image it gave a tint scarcely appreciable, and its thinness enabled it to disappear under the penetrating action of alcohol varnish. But when all these experiments had terminated a final trial proved to me that my starting point of reasoning was based upon an error, and that this opalescence was neither owing to incomplete fixing nor to a want of penetration, but to a cause more simple, namely, the powdery texture of the film of collodion, which gave to the negative plate the properties of finely-ground glass.

I vainly tried to completely fix a plate which accidentally (and from causes which are yet to be searched for and fathomed) presented on its collodion surface a structure very coarse. Notwithstanding repeated washings with alcohol, followed by a prolonged immersion in the fixing bath, the opalescence, or, more correctly, the grain, remained, and a great similarity of appearance between this negative and the result of my previous experiments obliged me to admit an identical cause; that is to say, the disaggregation of the "couch" of collodion gave to the negative plate the appearance of being finely ground.

If this disaggregation be very fine it will disappear by the simple contact of the alcohol, which swelling, and without doubt softening, the substance of the collodion, permits the particles to unite to one another, and restores the transparence. Thus it suffices to pour pure alcohol or pure ether upon an opaline plate in order to cause the opalescence to disappear, even after the evaporation of the liquid; but if the grain be too coarse the opalescence returns when the collodion is dry, because its grains cannot then unite together. They require a medium, and therefore the opalescence disappeared by the action of a varnish. As an inference, I believe I am able to say that, from the conditions before named, the opalescence which remains after the fixing and drying of certain negatives is due to the pulverulent structure of the film of collodion, and not to the remains of bromide of silver in the film, and, in consequence, this opaline "couch" cannot possess sensibility either to light or to the chemicals that may be employed to intensify the image.

The opalescence disappears completely under the action of varnish or of such substances as penetrate the structure of collodion. To prevent this opalescence showing itself it suffices to pour alcohol on the plate, and then continue all the operations of developing and fixing the negative without allowing the film to dry. It is, in fact, unimportant whether the negative be fixed directly after development or, later, after desiccation; however, in this latter case, to obtain more rapidly and more completely the fixing, it is desirable to wash the plate plentifully with water, or, better still, to pour upon it alcohol at thirty-six degrees.

If the film and image are to remain upon the glass (in France the removal of the same is much practised) the varnish will suffice to ensure perfect transparence; if it is to be detached upon gelatine the film of gelatine will have the same action as the varnish.

I ought to make the following remark:—With certain plates upon which I experimented—but of the process by which they were prepared I have no knowledge—the film of collodion emulsion was dissolved by the application of alcohol at forty degrees, but not with alcohol at thirty-six degrees. One ought, therefore, before varnishing *clichés* to be assured, by having made a previous trial upon a bad plate, that the varnish about to be employed has not this solvent action. If it be found to have such, a remedy is found in a thin film of either albumen, gelatine, or gum arabic at ten per cent., upon which, when dry, the varnishing may be proceeded with in all security; or non-alcoholic varnishes may be employed. Amongst others, amber dissolved in benzine and thoroughly dried answers well.

Apropos of the fixing of negatives of bromide of silver, I may state that M. Chardon and also M. Bardy have tried fixing agents other than hyposulphite—such as a weak solution of cyanide of potassium, or the alkaline sulphocyanides in concentrated solutions —and that the results are excellent. M. Chardon, particularly, found advantage, while on his excursion during the vacation, in the employment of sulphocyanide of potassium or ammonium at twenty per cent. The effect was nearly instantaneous. Less abundant washing than when using hyposulphite was sufficient to remove this agent; and even if there remained any traces its attraction for humidity prevent its crystallising upon the image, while it sometimes happens that the hyposulphite of soda forms a sort of white frost, and ruins the *cliché* completely. Thus these several properties form a reason for the employment of sulphocyanides for fixing during excursions far away from home.

A. Davanne.

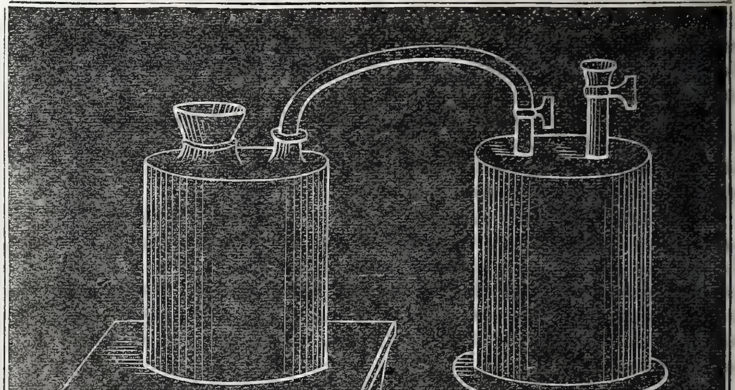
NOTES ON GELATINE EMULSION.

From a communication in the Journal of the 9th instant, I see that Mr. W. Maxwell Jackson does not succeed in getting on a gelatine film an image of such roundness and sharpness as he produces on that of collodion. I am somewhat surprised at this, as, in Edinburgh at least, the general impression is that such qualities are just those in which gelatine pre-eminently excels. Probably the best proof that can be given of the suitableness of the gelatine film for ordinary work is the fact that several of the best known and most successful Edinburgh professional photographers have, after a trial of the plates prepared by a local manufacturer, each gladly paid him a good round sum to be initiated into his method of manipulation, and these include both portrait and landscape workers. Now there is nothing in his method that imparts a superiority either in sharpness or roundness over any other form of gelatine. He claims only the ability to obtain sensitiveness, with immunity from fog and with any required degree of density.

As a result of many experiments I am of opinion that the sensitiveness of gelatine emulsions prepared with a trifling excess of silver, and especially in cases in which a trace of excess of bromide exists, is very much overrated, and consider it more than probable that the faulty image is due to under-exposure. Presuming, however, that sufficient exposure has been given, there can be no doubt that the key-note of success is the possession of a perfect acquaintance with the best means of development of the image. Now, this is only to be acquired by considerable practice and very careful observation. The gelatine film, as generally produced, is much more opaque than one of collodion, and increases in opacity on the absorption of moisture; so that little aid or information is to be got as to the progress of the operation by an examination by transmitted light, especially as if the plates are very sensitive the light must be somewhat feeble. The operator has therefore to trust, to a large extent at least, to the appearance of the back of the image by reflected light; and, as the subsequent removal of the unaffected silver bromide so largely changes that appearance, it will be evident that the successful development of a gelatine film is a matter requiring more experience than that of collodion. If gelatine workers will only bear this in mind, and attribute a faulty image to their own inexperience rather than to any inherent defect in the material, they will do much to place that substance in the position to which I consider it is entitled.

There is sometimes considerable difficulty in filtering emulsions, especially those having gelatine as a basis, as in addition to their viscidity, which makes their passage through a medium of sufficiently close texture a somewhat slow process, they get rapidly thicker as the temperature falls. The following method, which I have just seen in operation, seems to answer admirably.

The apparatus consists of a cylinder of tinplate, closed at both ends, about six inches high and four inches in diameter, but may be of any size suitable for the quantities to be operated on. Into the upper end is soldered two tubes fitted with stopcocks, and to one of them is attached a piece of wire-lined rubber tube. The other end of this is fastened to one neck of a two-necked Woulff's bottle, and into the other neck, which should be as large as possible there is fitted a funnel the tube of which has been cut off. This, as well as the rubber tube, must be fitted with cork so as to be air-tight,



and over the whole in the cork, before pressing in the funnel, should be laid the filtering medium, which may be felt, flannel, or anything else suitable.

The method of using the apparatus is as follows:—A few ounces of water are put into the cylinder, the cock to which the rubber tube is attached closed and the other open, and heat applied by means of a Bunsen's burner or spirit lamp till the water has boiled for a few minutes. While this is being done the emulsion to be filtered is poured into the funnel, which, in the case of gelatine, should have been previously warmed. As soon as the water begins to boil steam will issue from the tube with the open stopcock, and when this has been allowed to go on for about two minutes that cock must be closed, the heat withdrawn, and the other cock opened. The steam from the boiling water displaces the air that had previously filled the cylinder, and when the cock is closed and the heat withdrawn it condenses and leaves a partial vacuum. The opening of the cock in connection with the rubber tube allows the air from the Woulff's bottle to rush in, and the pressure thereby brought to bear on the surface of the emulsion in the funnel forces it through the filter rapidly. Should even a more rapid action be desired it may be obtained by sprinkling some cold water on the cylinder, which will effect a more rapid condensation of the steam.

The foregoing diagram will make the arrangement so plain that any one may get the apparatus constructed for himself.

John Nicol, Ph.D.

SPLITTING OF NEGATIVE FILMS.

[A communication to the Bristol and West of England Amateur Photographic Association.]

A communication, by Mr. Dunmore, in The British Journal of Photography for January 19th of the current year, *On the Splitting of Negative Films*, I should probably have passed over as possessing no particular interest for myself had I not suffered, to some extent, from a similar cause this winter.

In my operating room, situated over my stables, I have kept several boxes of negatives which I took in India between the years 1865 and 1873, and which I prize considerably. The room is generally damp, and was extremely so during the past extraordinary winter. On examining the negatives, a few weeks ago, I was horrified to find that all of them were covered with moisture, and that the films of several had split. These negatives were taken with Thomas's and Mawson's collodions, generally in combination, and were protected by Rouch's negative varnish. I do not believe that either of these substances has been the cause of the injury, nor do I think that the damp has, *per se*, been the active agent.

The splits are all of the same character—wavy, semi-circular, and angular; the film is loosened, and the split parts could, at the time, be moved about with the finger, being separated from the glass.

The following table shows the year when the negatives were taken, and the number of those in which the films have suffered:—

Date of taking Negatives.	Number of Negatives taken.	Number of Negatives with Split Films.
1865	23	1
1867	33	9
1873	32	1
Totals	88	11

My impression is that, in most instances, where good chemicals are used, the splitting of films is due to a trace of hyposulphite of soda remaining in them. I feel certain that this is the cause in my own negatives, from the fact that those which have suffered were taken in the field, and that imperfect washing was common under the circumstances. Had the extreme dampness of the weather been to blame it is reasonable to suppose that the bulk of the negatives—perhaps all—would have had split films, as they were kept under similar conditions in deal boxes, and were, moreover, quite wet when examined.

I think the reason of the negatives having remained so many years unaffected is that the trace of hyposulphite was so exceedingly small that it required an abnormally damp season to act upon them; and that, had there not been an actual condensation of moisture on their surfaces, they would not have suffered at all, ordinary hygrometric conditions of the atmosphere being insufficient to penetrate the varnished films.

— Mantell, M.D.

HAS PHOTOGRAPHY ANY CLAIM TO BE CONSIDERED A FINE ART?*

I will read to you some extracts from the works of the greatest art critic of the age, who has placed on record in his writings a decided opinion on the art claims of photography. The passages may be found in the *Stones of Venice*, vol. iii., under the divisions "Grotesque Renaissance," and "Conclusion;" and in *Modern Painters*, vol. i., sec. 1. Ruskin is a critic whose utterances should always be received with respect and attention as those of an earnest and original thinker, worthy of the most attentive study—perhaps most of all where his readers differ from him.

Mr. Ruskin's opinion is by no means flattering to photography, unless it be by implication; but it is far less so towards painters, whose claims he rejects almost *en masse*. He places photographers upon the same level with nine-tenths of those who affect to look down upon photography as a mechanical pursuit. He does this, not by elevating photographers to the lofty plateau the others suppose themselves to occupy, but by pulling the painters down to the photographers' assumed level. To begin with: he demands a much more accurate definition of the word "art" than any now current. He says all men do ingeniously is art in one sense. "Strictly speaking there is no such thing as 'fine' or 'high' art. All *art* is a low and common thing, and what we indeed respect is not art at all, but instinct or inspiration expressed by the help of art." Briefly, he denies to all art manufacture of any kind whatever, or by any means whatever, unless it possesses in some degree the inspiration of genius, the claims understood by the ill-defined term "fine art." He says, emphatically, "it is no more art to manipulate a camel's-hair pencil than to manipulate a china tray and a glass vial."—"It is no more art to lay on colour delicately than to lay on acid delicately."—"It is no more art to use the cornea and retina for the reception of an image than to use a lens and a piece of silvered paper."—"But the moment that inner part of the man, or, rather, that entire and only being of the man, of which cornea and retina, fingers and hands, pencils and colours, are all the mere servants and instruments; that manhood which has light in itself, though the eyeballs be sightless, and can gain in strength when the hand and the foot are hewn off and cast into the fire; the moment this part of the man stands forth with its solemn 'Behold, it is I!' then the work becomes art indeed, perfect in honour, priceless in value, boundless in power."—"Yet, observe, I do not mean to speak of the body as soul and separable. The man is made up of both; they are to be raised and glorified together, and all art is an expression of the one by and through the other."—"So that by the work of the soul I mean the reader always to understand the work of the entire immortal creature, proceeding from a quick perception and large heart, perfected by the intellect, and finally dealt with by the hands under the direct guidance of those higher powers."

As a further illustration of his meaning, Ruskin quotes a passage from Plato, Alcibiades I.:—

Socrates.—This, then, was what I asked you: whether that which puts anything else to service, and the thing which is put to service by it, are always two different things.

Alcibiades.—I think so.

Socrates.—What shall we then say of the leather-cutter? Does he cut his leather with his instruments only, or with his hands also?

Alcibiades.—With his hands also.

Socrates.—Does he not use his eyes as well as his hands?

Alcibiades.—Yes.

Socrates.—And we agreed that the thing which used and the thing which is used were different things?

Alcibiades.—Yes.

Socrates.—Then the leather-cutter is not the same thing as his eyes or hands?

Alcibiades.—So it appears.

Socrates.—Does not, then, man make use of his whole body?

Alcibiades.—Assuredly.

Socrates.—Then the man is not the same thing as his body?

Alcibiades.—It seems so.

Socrates.—What, then, is the man?

Alcibiades.—I know not.

In short, with Mr. Ruskin means are nothing; the thing expressed, by whatever means, is everything. Painting is a language, with all its technicalities and difficulties, invaluable as the vehicle of thought, but by itself nothing. He who has learned what is commonly considered the whole art of painting has, as yet, only learned the language by which his thoughts—if he have any—are to be expressed. He has done just as much towards being that which he ought to respect as a great painter as a man who has learned how to express himself grammatically and melodiously has done towards being a great poet. The degree of difficulty of acquirement of any medium of art-expression does not alter the principle enunciated. "It is not by the mode of representing any saying, but by what is represented and said, that the respective greatness of the artist or writer is to be finally determined."

If this be the true theory, photography, if it can produce anything stamped with poetic thought, is equally entitled to the highest honours, and no detraction is to be made as to the means used to the end sought; and this alone brings us to the limitations of photography. An artist will point out that it cannot render action, motion, &c. Unfortunately this is, to a great extent, quite true, and the limitations are great. But, although it can do none of these things, I wish to point out that some of the great modern pictures are such as might have been represented by photographic means, provided only the conception had been forthcoming—the inspiration, the greatness, nobleness, or pathos of which Mr. Ruskin says determines its claim to be a work of fine art or not. I may instance the *Origin of the Harp*, by Daniel Maclise—a most poetic conception, in my estimation. I have no doubt the late Mr. Rejlander could have rendered that picture in monochrome by photographic means alone, provided only he had realised the conception; and it is this power to conceive, seconded by the power to execute "without any regard as to the manner of execution," guided by the laws which govern all modes of art expression alike, which constitutes the man an artist, or the result of his labour "a work of art." ANDREW BOWMAN.

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* Concluded from page 547.

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ON THINGS IN GENERAL.

CARBON is having a long innings at last, and deservedly so; for, after a long battle against ignorance, prejudice, and actual ill will, it has steadily progressed till at last silver has all its powers taxed to hold its own.

I have read with a very great amount of interest the particulars of the latest improvements in carbon which the Editors of THE BRITISH JOURNAL OF PHOTOGRAPHY, with their usual enterprise, have been able before any one else to communicate in detail to the photographic public. It is scarcely necessary for me to say that I allude to Mr. Johnson's new patent processes. Mr. Johnson is evidently an ardent worker; and, after Swan's great practical discovery, which opened pigment printing to real everyday work, I know of no one who has done more to improve its processes. The new methods of working contained in the patent just published bear the impress at once of real workable plans of treatment, which, while not apparently differing to a great extent from the customary modes, will, I believe, turn out to be good things. Of course we shall have the usual reclamations and statements from every quarter that the writers thereof have practised the described mode of treatment for years; but that is the usual fate of inventors, especially in photographic walks of art. Mr. Johnson will have to fight his battles himself, I do not doubt.

I must say I cannot offer equal congratulations to other discoveries in pigment printing; in fact, so far am I from being able to do so, that I cannot remember ever seeing anything written that seemed to me further from the true circumstances of the case than Herr Freidlin's remarks about half-tones in connection with this class of work. He calls attention to the fact that, especially in reproductions, the high lights strike the eye as being much harsher than silver prints from the same source would be. And he further attributes the superiority of the latter to the fact that albumenised paper is usually supplied of a lightly-tinted description, this not being the case with carbon prints, which are usually of a deadly white, he says. On these premisses he goes on to recommend transfer paper to be tinted of a delicate rose colour. Now, my experience of carbon printing is just the opposite of this, and to recommend the most inartistic method of reducing hardness by degrading the purity of the whites is, and always has been, to my thinking (for the method is as old as the hills as applied to silver) a wretched expedient to cover bad manipulation.

The same gentleman has some very pertinent remarks to offer upon the use of aniline dyes in pigment printing, against which in former communications I have "had my say;" but their value is at once destroyed by his recommendation to use carmine dissolved in ammonia as the tinting agent. Carmine! one of the most fugitive of colours!

Mr. Wake is still interesting the readers of this Journal by his most useful papers on painting photographs, which I should recommend the Publisher of this Journal to issue in a book form for ready reference upon the completion of the series. But I must have a word to say upon one of the matters Mr. Wake introduces into his text. He says:—"Some artists take an albumenised print of the head, cutting it carefully out," and, with due precaution to prevent the junction showing, "glueing it on a piece of plain paper large enough to admit of a body, or part of a body, being sketched to it. . . . Bits of ivory are also let in with photographs of the head and hands on a similar principle." Note how carefully Mr. Wake abstains from any recommendation of the plan; and, as he now stands in these articles not merely in the position of a technical educator, but as one whose æsthetic teachings should have weight, I ask him if he does not consider it a most inartistic and æsthetically reprehensible practice? I have seen a very great number of these things in one place or another, but of all the atrocious, inartistic, flashy productions it has been my experience to come across these carried off the palm. It is certainly little better than Chinese or Japanese art, as at present understood, and in some respects inferior.

What an interesting communication in *Foreign Notes and News* is that from Baron Stillfried in a late number of this Journal about Japanese photography. What an Arcadia for photographers—employers—must Japan be! Wages for native operators from half-a-crown to fifteen shilling a-week! The latter, too, being evidently something quite out of the common. This *couleur de rose* representation, however, is open to some doubt or some explanation out of the common, for in the next paragraph we are informed that it is common for a native photographer, with a studio of his own, to be the possessor of three glasses only, upon which he does all his work, sitters rarely requiring more than two prints from a negative, and washes the films off when done with; varnishing being an unknown operation under the conditions. The only comment I have to make about the latter is—how about the printing in dull weather? There could not be much work done at an establishment of that kind. Perhaps, however, the "foreign devils" take all the custom, so the natives are glad to get their hebdomadal half-crown.

Our old friend, the "Peripatetic Photographer," has been speaking of late of photographing "dumb animals," expressing his opinion that he must indeed be a clumsy photographer who cannot manage to obtain a photograph of a dog possessing the utmost sharpness. All I can say is I have often tried it, yet I must put myself into the class of clumsy ones. It is all very well with a nice, white-curled darling that will coil itself up on a chair; but how about a large black retriever or Newfoundland dog, who, be he in ever so good condition, will pant and shake and heave his sides two or three times a second, who can rarely be got to put his limbs into anything but an ungainly sprawl, and, if he lie down, generally does so in such a fashion that gives such foreshortening of his limbs that he appears misshapen and disproportionate to an extent that would ensure the rejection of the sharpest picture in the world? So, Mr. "Peripatetic Photographer," just try your hand on a few big Newfoundlands and retrievers—always, be it understood, to be black in colour—and let us see if you don't change you views! FREE LANCE.

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OPINIONS OF THE LONDON PRESS ON THE PHOTOGRAPHIC EXHIBITION.

THE PHOTOGRAPHIC EXHIBITION.—The Photographic Exhibition, which is now open at 5A, Pall-mall East, is well worthy of a visit by all lovers of the art-science, exemplifying as it does the progress that has been made in dry-plate processes. The perfecting of these processes must have a marked effect on the future of photography, as when they are capable of being employed under all circumstances, the heavy paraphernalia attendant on the wet process may be consigned to the lumber-room, and the worker in the field or laboratory need only be dependent on his box of sensitive plates and his camera. We cannot enumerate all the processes examples of which are exhibited. We may mention, however, that the simple bromide of silver emulsion either held on the plate embedded in collodion or gelatine appears to bear away the palm for excellence, unless it be the process with which Mr. England has produced his splendid collection of Swiss views, in which (though no information is given in the catalogue regarding it) we think we can trace the delicacy due to albumen in the sensitive film, combined probably in some way or another with bromide of silver. Another feature of the exhibition are the enlargements which are shown by various exhibitors, amongst whom we may name, as being specially worthy of mention, the Woodbury Company, the Royal Engineers, and the Autotype Company. The enlargements taken by Mr. E. Viles with the microscope are also worthy of more than a passing remark. They are all beautifully executed, but perhaps the picture of the proboscis of the common blow-fly should be specially singled out, being almost perfectly enlarged to 200 diameters. We believe that a comparatively low-power objective was employed, and that from the small negative obtained by it an enlargement in Monckhoven's solar camera was produced. These picture are hung too high to be well seen, and Mr. Viles perhaps might be persuaded to show them at some of this season's scientific *soirées*. As regards the application of photography to scientific purposes there are no other examples to be found in the exhibition—a matter which we deeply regret, seeing the large use that is made of the art-science in nearly every investigation of the present day. As regards the artistic element present, it is not in our province to dwell upon it. In many examples of portraiture it would have been well had that abomination—retouching of the negative—been avoided. As showing what a grand pencil is sunlight to the artist, we may mention the exhibits of Robinson, Blanchard, Mrs. H. Roscoe, and Slingsby, in all of which are to be found true artistic feeling and perfect manipulation. The works of Payne Jennings, Bowness, the Royal Engineers, Stephen Thompson, and England may be classed amongst the best of the landscape work. Amongst technical work we have examples of a capital photo-relief process by Warnerke, by which an artist's own drawing can be faithfully reproduced as a block for surface printing. The mechanical printing processes from gelatine are also admirably represented by the Autotype Company, as is that known as Woodburytype. This notice would be incomplete without calling attention to the photographs taken during the recent Arctic expedition under Sir G. Nares, which have been exhibited by the Admiralty, and also to those taken by Mr. Grant, who accompanied Sir Allan Young in the *Pandora*. Both sets of photographs are very good when the difficulties under which they were taken are considered.—*Nature*.

THE PHOTOGRAPHIC SOCIETY.—This Society is again holding its annual exhibition in the gallery of the Water Colour Society, Pall-mall East, which is hung with about five hundred and forty examples of the art, including those displayed on the screens. It appears to us that during the last very few years photography has reached such a point of excellence that to go beyond it is scarcely to be expected—is, indeed, simply impossible; and if the society is unable to show that any strides have been made in a new direction since its last public exhibition, and if the increased skill and knowledge of our leading photographers have produced no novelties, it may at least be maintained that nothing has been lost. If, on looking round the gallery, we miss from its walls the rich and beautiful masses of colour the painters give us when the room is open in the months of the spring and summer, we have still the picturesque composition, and the lifelike individualities of nature, such as no human hand could trace out on canvas or paper; and side by side with the beauty of landscapes are individualities of another kind—in the "human face divine," either singly or grouped in companionship with the landscape, or engaged in occupations of various kinds. The Royal Engineers' School of Photography at Chatham exhibits numerous exquisite examples of the art, conspicuous among which is *Woodland View, Deer Leap Wood*, wherein the distant haze of a misty morning is marvellously expressed, softening, but not concealing, the objects whereon the subdued sunlight rests. Stillfried and Andersen, of Japan, contribute some very interesting specimens of the people and scenery of that far-off country. Colonel Stuart Wortley is, as usual with him, grand in his delineation of wave and cloud. Wonderful *Studies* they are in breadth of expression, variety and force of cloud-form, and in curve of ocean wave crowned with beams of sunshine, and rippling waters moving lazily out to sea and sparkling as they go. Some such scene as the latter is the pretty girl contemplating, whom Mr. R. Slingsby represents, under the title of *Alone*, seated on a bench overlooking the sea—a most attractive picture in every way. *Studies of Children*, by Mr. R. Faulkner, is a frame containing upwards of seventy pictures of little ones, in almost every conceivable attitude and action—an amusing and pretty "portrait gallery." *Waiting to Go On*, by the honorary secretary of the society, Mr. H. Baden Pritchard, is also an amusing picture—a child dressed in "motley" waiting the stage manager's summons before the curtain. Among several very charming landscapes by Mr. F. Beasley we particularly notice two Devonshire scenes, *Ivy Bridge* and *Holy Street Mill. Lizzy* and *Eliza*, by G. Nesbitt, are two striking and spirited portraits; and his *Tired Companions*—a noble dog and a young child sleeping together on the floor of a room—is a pretty subject treated with true artistic effect. H. P. Robinson, of Tunbridge Wells, contributes a most effective picture which he calls *When the Day's Work is Done*—an aged couple seated in their cottage home, the man reading the Bible to his wife. If this be taken from life it is a wonderful application of the artist's taste in arranging his materials, so skilfully and pictorially are they set out and so efficiently is the whole produced. *Thunder and Lightning*, exhibited by the Autotype Company, is from a painting by L. Cattermole. It shows a herd of horses alarmed by the storm, and careering about as if they were wild animals. The composition reminds one of Mdlle. Rosa Bonheur's *Horse Fair*. *Bird Nesting*, by A. Ford Smith, of Llandudno, presents to the spectator three or four young girls, in pretty walking costumes, searching for birds' nests among the shrubs and brambles of a wild-looking expanse of copse; a more attractive picture of its kind one can scarcely imagine. H. Painter, of Brighton, famous for his amusing photographs of *Cat Life*, has numerous specimens of these domestic animals. Mr. S. Thompson's architectural views of continental towns and cities could not be excelled. Besides the photographs from Japan already noticed, there are specimens from F. Gutekunst, of Philadelphia; C. Klary, Algiers; B. Mischewscki, Dantzic; Dr. van Monckhoven, Ghent; C. Relvas, Lisbon; Schulz and Suck, Carlsruhe; Taeschler, Schwartz, in Switzerland; and L. W. Seavey, New York, whose contributions to the society testify to the interest felt by foreigners in its operations. On the table in the gallery are various objects connected with the practice of the art—stereoscopes, cameras, photographic albums, lantern slides, &c.—exhibited by Messrs. Murray and Heath, G. Hare, and others.—*Art Journal*.

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Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
Nov. 29	Liverpool Amateur (Ann. Meet.)	Free Library, William Brown-st.
,, 29	Oldham	Hare & Hounds Inn, Yorkshire-st.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE annual Technical Exhibition of this Society was held at the House of the Society of Arts, on Thursday evening, the 15th instant,—Mr. P. Le Neve Foster, and afterwards Mr. Jabez Hughes, occupying the chair. There was a large attendance.

Mr. JABEZ HUGHES explained the nature of these annual exhibitions—how that everything indicating progress was gladly welcomed even though it be the result of a secret process, and that for once in a year "shop" might be brought to the front in as strong a manner as might be justified by the nature of each case.

Among the various matters exhibited were the following:—

Mr. THOMAS BOLAS exhibited a scenograph by Bardelli, of Turin. This mainly differed from the well-known scenograph—which was introduced into this country by Mr. W. B. Woodbury, and which has been described in detail in this Journal—by having its body distended by means of rigid wires instead of by slips of wood. The stand, too, was very rigid and portable; but, as was remarked at the time, it would have been better had it been at least eighteen inches taller.

Mr. BAYNHAM JONES having called attention to the fact that he stood before them umbrella in hand and without any apparatus, proceeded to show that he was in reality fully equipped for photography. His "umbrella" was found to be a camera-stand of very portable construction and apparently possessing rigidity quite sufficient for his camera, which he extracted from one of his pockets and opened out. The dark slides were accommodated in a second pocket. Portability in the whole arrangement seemed to be reduced to a minimum. The front of Mr. Jones's camera was enabled to slide in two directions, laterally and vertically, by means of a pair of L-shaped slots, one each at top and bottom of the front.

Attention was now directed to the space behind the Chairman, which was fitted up with one of the backgrounds and some of the side slips of Mr. Lafayette W. Seavey, of New York, and photographs showing the various patterns of backgrounds were handed round for examination.

Mr. E. DUNMORE exhibited a plate-holder which he extemporised out of wire. When completed it formed a square frame over which were extended several bands of india-rubber, *a la* gridiron. There was a wooden handle at one corner. Mr. Dunmore also exhibited an oval mat made of sand-paper, which, when superposed upon a photograph and passed through a rolling-press, gave a granulated effect to the margin of the picture.

Mr. F. YORK exhibited an ingenious appliance for cleaning plates. It consisted of a short, round bung with a flat end, having distended over it a piece of wash-leather or other fabric, which was kept tight by means of a strong ring sliding over it. These had, he said, been designed by Mr. Oakley, and specimens in wood and vulcanite, as well as in cork, were exhibited. They formed an invaluable rubber for cleaning plates when used with any suitable cleaning powder, such as powdered pumice-stone, whiting, or rouge. Those made of vulcanite were useful when acids had to be applied to the plate. He (Mr. York) also exhibited and described Ross's patent filter, of the nature of which our readers have already been made aware. After concluding his description Mr. York gave the following good practical advice with regard to the use of filters in general:—Do not pour the liquid to be filtered into a *dry* filter, but first moisten it by pouring in a little water or alcohol according to the description of fluid to be passed through it; by doing so the filtration will be much more easily effected.

Mr. ALDRIDGE demonstrated the manner in which he preferred to filter solutions, viz., by placing a plug of sponge in the neck of the funnel. He also exhibited a small box with a pressure-screw, by means of which *cartes* could be kept flat. He further showed a lens-cap fitted with coloured tissue paper or glass, so as to give auxiliary exposures.

Mr. W. M. AYRES exhibited an ingenious contrivance which he had had adapted to the front of his camera, being a circular rotating plate like the diaphragm plate of a microscope, every aperture being fitted with transparent discs, each being of a different colour. By means of these he had conducted a number of experiments in connection with pre-lighting and supplementary lighting of the negative. A number of photographs illustrating the effects produced by each colour were submitted to the meeting.

Mr. E. COCKING also exhibited a cap containing a piece of coloured glass, and gave an account of its action.

Mr. J. T. TAYLOR exhibited the following articles, viz.:—1. The most recently-produced examples of M. Leon Vidal's polychromes. 2. An oxygen retort which had been lately introduced by Mr. Chadwick, of Manchester. 3. An adjustable levelling camera-stand by Mr. J. L. Lane. 4. A large and fine collection of photographs painted by Mr. J. Solomon, of Red Lion-square, by which the effect of oil paintings was obtained by means of a process of working behind the picture. 5. A simple method of preventing any of a set of Waterhouse diaphragms from getting lost, namely, by rivetting them altogether, by means of a hole through the thumb-piece of the stop, in such a manner that they would rotate easily. With this simple invention he coupled the name of Mr. Warnerke. 6. A well-bath with a light-proof cover, which had been constructed for Mr. Foxlee—its object being to allow the plate, after being sensitised, to be reared on end to drain in a moist atmosphere, so as to prevent oyster-shell or surface markings. 7. A triple-wick paraffine lamp for a magic lantern, by Mr. W. C. Hughes, of Hoxton. 8. Mr. Brice's "ladies' camera." *Apropos* of these exhibits Mr. Mawdsley spoke in strong commendatory terms of Lane's stand, confirming all that Mr. Taylor had said in its favour. Mr. Solomon, too, in reply to a question, said that by his method of painting behind a photograph the likeness was completely preserved. Colour might, in addition, be applied to the front if desired.

An appliance for varnishing the margins of plates, by Mr. G. S. Penny, of Cheltenham, was exhibited.

Mr. R. W. Allen exhibited a dark slide much in use in America.

Mr. Archer Clark, of Stourbridge, exhibited a hot-water bath with sloping and flat sides for warming negatives previous to varnishing them, the leading idea in this being that a kind of saucepan was fixed between the sloping sides of the apparatus, and this being heated by an atmospheric burner generated steam, by which the flat sides were warmed. He also recommended that brass pipes, upon which india-rubber tubes were to be sprung, should terminate with a sloping instead of a straight-cut end.

Mr. T. J. Pearsall exhibited several stereoscopic drawings made by the compound pendulum apparatus of Tisley and Co.

Mr. Harrison exhibited an ingenious method of packing wet plates in a box, by passing round and between each, at the ends, a piece of string. He also exhibited an apparatus for cutting ovals in paper or board to any scale or in any dimensions.

Mr. William Brooks exhibited a dropping-tube, made by covering a thistle-shaped funnel with india-rubber, the lower terminal being drawn to a fine point. He also exhibited a "photoscope," the nature of which will be seen from an article in another page. He further exhibited some fine transparencies, and a hot-water bath for drying emulsion plates.

Mr. Bridge spoke of the advantage of using a flat hot-water bath for developing paper prints.

Mr. D. Dallas exhibited a fine collection of Dallastints.

Messrs. Wright and Co. exhibited cards of designs of gold chains and jewellery, printed upon a rich orange-coloured paper in such a manner that the background was black, while the articles were printed in gold colour.

Mr. W. B. Woodbury exhibited some exceedingly fine pellicular lantern slides, the tone being unusually good.

Mr. F. York then explained, and showed in action, Keevil's patent duplex lantern (of which we give details in another page); after which,

The Chairman (Mr. Jabez Hughes), in the name of the meeting, thanked the gentlemen who had made the several exhibits.

On the motion of Mr. J. G. Tunny, of Edinburgh, thanks were accorded to the Chairman, after which the proceedings terminated.

GLASGOW PHOTOGRAPHIC ASSOCIATION.

A meeting of this Association was held on Wednesday evening, the 14th inst., for the purpose of witnessing experiments with Keevil's duplex lantern, and the exhibition of a number of Mr. F. York's transparency views.

Mr. Parker, Vice-President, who occupied the chair, briefly introduced Mr. McCall, the exhibitor, to the members.

Mr. McCall said he had been asked to undertake the description of the lantern and show its working capabilities in the unavoidable absence of Mr. York, but he felt that the latter gentleman would have been much more able to do it than he was. Its simplicity, economy, and portability, combined with the greater ease and certainty obtained by its use, were, he said, distinct features of the instrument, whilst it would be seen it had also many other advantages over the other forms of lanterns now in use. Its principal feature was its ability to produce all the effects of dissolving views by means of one lantern—an effect hitherto only obtained by the use of two. One of the lenses was prismatic, against which many had a prejudice; but by an optical arrangement it was made to give a light equal in brilliancy to that given by the double achromatic combination.

One of Young's generators was used as a stand for the lantern, and thus the operations of making the gas, using it, and showing views were all seen going on at once, and that in a very limited space. The members expressed themselves highly pleased with the invention, and thought it came up to everything its inventor and Mr. McCall claimed for it. A number of York's famous transparencies were exhibited, the whole evening proving an exceedingly pleasant and enjoyable one.

Before separating Mr. Urie called attention to a letter he had received from Mr. Norman Macbeth, A.R.S.A., respecting a remark he had made as to Mr. Macbeth using photography and the lantern as an aid to portrait painting, of which the following is a copy:—

28, *Saxe Coburg Place, Edinburgh, November* 3, 1877.

Mr. Urie, Photographer, Glasgow.

Sir,—I was very sorry to find that at the last meeting of the Glasgow Photographic Association you made a statement which is quite unfounded. I don't think you meant me any harm, and I would not have heeded had it stopped at the Society; but I find it in The British Journal of Photography that you believed me to paint from enlarged photographs by lantern. I take this opportunity of emphatically denying that I ever had recourse to such a method.

I trust you will see it to be your duty to withdraw your belief at the next meeting.—I am, Sir, yours respectfully,

(Signed) Norman Macbeth, A.R.S.A.

Mr. Urie said he felt extremely sorry if Mr. Macbeth had been put to any annoyance by his remark, and he assured the members that he not only did not mean Mr. Macbeth any harm, but that when he made the statement he had no positive proof for it, his only ground for making it being from hearsay. Mr. Macbeth's renown and well-known ability, not only as a painter but a draughtsman, plainly indicated he had no reason to use photography and the lantern as an aid in his profession. He begged to withdraw the statement he made at the previous meeting, and to apologise to Mr. Macbeth for having made it.

A vote of thanks to Mr. McCall and the Chairman brought the meeting to a close.

BRISTOL AND WEST OF ENGLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

The ordinary monthly meeting of this Association was held at the Museum, Queen's-road, on Wednesday, the 7th inst.,—Colonel Biggs in the chair. The minutes having been read and confirmed,

The Secretary read a communication from Dr. Mantell, corresponding member, entitled *The Splitting of Negative Films.* [See page 559.]

Mr. Brightman considered the quality of the washing water had a great deal to do with it. A friend of his in the Isle of Sheppy, who was most particular as to the thoroughness of the washing given, died, and some of his negatives were given to him (Mr. Brightman) who placed them in a box with a lot of his early productions, about which it is probable he was not very particular. The box was put in a damp place, the result being that his own negatives did not suffer, whereas his friend's were all cracked. The water in the Isle of Sheppy contains a great deal of chloride of sodium, which he considered deliquesced under the influence of damp, and so was the cause of the cracks.

Lieut. Lysaght considered it was mainly due to the difference in the gums used in the varnishes that are made.

The Chairman said that, against his wish, the Government printed a number of pictures of Indian architecture in the depth of winter, and, as a consequence, lost over two hundred in the same way as Dr. Mantell. He thought that the difference in the temperature had much to do with it, as when they were taken the temperature was from 90° to 115°. The expansion of the glass, he fancied, was possibly the cause.

Lieut. Lysaght remarked that, if so, theoretically the cracks should close up when the glass regained its normal state. He still adhered to his opinion that the fault lay with the gums, especially as the cracks did not appear for years.

Some further discussion and private matters of the Association took up the remainder of the evening. Some very fine paper negatives, exhibited by the Chairman, the subjects being Indian scenes, were greatly admired, the delicacy and sharpness of detail being absolutely perfect.

A cordial vote of thanks was accorded to Dr. Mantell for his interesting communication, and the meeting was adjourned.

Correspondence.

ON THE COLOUR OF EMULSION FILMS VIEWED BY TRANSMITTED LIGHT.

To the Editors.

Gentlemen,—With reference to your article in The British Journal of Photography of the 9th instant, drawing attention to the alteration in the colour of certain emulsion films when rubbed with the finger and viewed by transmitted light, permit me to make a few remarks.

At first sight, the hypothesis that the friction reduced the coarse particles to a finer state of division would appear correct; but the following experiment will, I think, prove that the rubbing merely removes the coarser particles:—

A quantity of emulsion (about two pints) which gave a film of a distinct violet colour, and had been placed aside as useless, was allowed to stand four days. At the end of that time, *without preliminary shaking,* two-thirds of the quantity was decanted into a bottle which, for distinction, was labelled "No. 1;" the remainder in the original bottle we will call "No. 2." A plate coated from No. 1 gave a film which, although thin, was of a decided ruby colour, while the second plate, coated from No. 2 bottle, *after being well shaken,* was of the original violet tint, proving that the coarse particles in the emulsion had subsided during the time it had been allowed to settle, and only the bromide of silver in extremely fine division remained in suspension.—I am, yours, &c., Thos. H. Wainwright.

38, *Great Queen-street, W.C., November* 19, 1877.

THE COFFEE PROCESS.

To the Editors.

Gentlemen,—During the past season an amateur friend of mine was desirous of preparing a few plates to try the coffee process, but he could not apply satisfactorily the necessary substratum of albumen. I gave him the following simple but efficacious method, which may be of some service to those who, like him, meet with the same little difficulty:—

Decant or filter the prepared albumen into a glass measure or other suitable vessel sufficiently wide to admit the insertion of a camel's-hair brush two or three inches in breadth. Provided with such a brush dip it lightly into the albumen solution, then pass it all over the face of the clean plate which you wish to albumenise. Lay the brush aside. Take hold of the glass measure and coat, cautiously to avoid air-bells, the same plate. Do this in the ordinary way, draining the surplus into the stock-bottle. If dust specks are seen after the operation hold the glass under the tap for a second or two, and then flow with the measure again. Success is certain. Anyone having the articles handy can verify this in a few minutes.

The above, epitomised, may be expressed thus:—Give the clean plate a preliminary coating of albumen solution, using a camel's-hair brush for that purpose; then immediately coat the *same* plate in the ordinary manner. I have never seen the above hint in print before, but you, gentlemen, who see so much, may have had it brought under your notice; still it may be worth repeating.—I am, yours, &c.,

Dundee, November 19, 1877. A. Donald.

◆

GRAINED DRAWINGS.

To the Editors.

Gentlemen,—I was not a little astonished, in looking over your Journal of the 16th inst., to find, under your *Foreign Correspondence*, that a patent has been taken out by a M. Gillot for what he evidently means to claim as something he has discovered, when it is in reality what I have been supplying the artist trade with for many years.

I send you specimens produced by my prepared paper; likewise a few pieces of prepared paper which you can draw on with chalk or pencil, when you will get the very same effect described by M. Gillot.

Excuse me for thus troubling you, but I could not resist calling this in question, and at the same time letting you know how matters stand in this trade, and which may be useful to some of your many artistic readers.—I am, yours, &c., George Cochrane.

7, *Drummond-street, Edinburgh, November* 19, 1877.

P.S.—If I had M. Gillot's address I would clear his understanding a little by sending him specimens similar to what I now send you.—G. C.

[If M. Gillot has obtained a patent for *this country,* of which we are not yet aware, it will undoubtedly be nullified by the prior claims of Mr. Cochrane, supposing, of course, that both processes are alike (which we are compelled to do), and that the date of M. Gillot's patent is later than the public introduction of Mr. Cochrane's process.—Eds.]

◆

DR. MONCKHOVEN AND MR. J. R. JOHNSON.

To the Editors.

Gentlemen,—It would appear difficult for Dr. Monckhoven to write on the subject of carbon printing without committing great inaccuracies. The *Historique du Procedé au Charbon* was full of errors, which were amply exposed by writers both in England and in Germany; yet he has repeated these erroneous statements, seriously affecting the honour and interests of others, with equally erroneous additions in the historical part of his *Traité Pratique.* In his present letter there is scarcely a paragraph which does not contain some false proposition or some loose statement.

1. I do not claim the use of alizarine with some metallic earth which does not render gelatine insoluble, as asserted by the learned doctor; but alizarine combined with alumina *and* with some earth or metallic oxide not combining with gelatine. Now, as Dr. Monckhoven asserts that he uses no alumina, and only alizarine and peroxide of iron—the latter of which does render gelatine insoluble—in what way does his mode of making pigment paper affect mine?

2. Dr. Monckhoven's red chocolate paper cannot be made of the materials he names, for the simple reason that it is a chemical impossibility to obtain a red colour, or a colour even approaching red, by such materials. He is evidently unacquainted with the nature and origin of the pigment he employs. Alizarine and peroxide of iron produce a deep black or, if much diluted, a violet colour, as every calico printer knows, and not a red requiring the addition of black to form red chocolate.

3. Dr. Monckhoven is kind enough to inform us that alizarine, &c., gives lakes and precipitates with acetate of alumina, &c., which are in colour red, brown, or even black! This is a fair specimen of the habitual accuracy of Dr. Monckhoven's compilations. The two substances named give a lake of a most brilliant rose colour, and neither brown nor black. The rose and pink madders of artists—the purest, most delicate, and most permanent of tints—are formed of alizarine and alumina.

4. I have stated that when alizarine is used in pigment paper with alumina the compound either stains the paper or renders the gelatine insoluble. Dr. Monckhoven denies the accuracy of these assertions. He has only become a carbon printer at the eleventh hour, and has but little experience in these matters, or he would have found the first proposition strictly correct. When the alumina is employed in insufficient quantity to precipitate the alizarine, the latter being soluble to some extent in warm water as well as in ammonia, and the transfer paper containing oxide of chromium, the free alizarine combines with the oxide and forms a dirty red stain. As regards the second proposition: I must refer Dr. Monckhoven to page 15 of his *Traité Pratique,* in which he tells us to avoid in the preparation of pigment paper the use of "all lakes containing alum," which have a "tendency to render the gelatine layer insoluble as soon as this is mixed with a bichromate." Has Dr. Monckhoven forgotten the principles he so lately laid down? or was the *Traité Pratique,* as is alleged of the *Historique,* written by another hand?

5. Dr. Monckhoven tells us that he is profoundly astonished to find that Mr. Johnson has not noticed that "alizarine does not give colours unalterable by the action of light *if in combination with bichromate of potash.*" I am quite at a loss to know where I have denied this proposition, or any proposition from which Dr. Monckhoven could draw such an inference. I should certainly be astonished to learn that the colours of alizarine were not seriously altered when mixed with bichromate of potash and exposed to light, for the simple reason that the chromic salt under the action of light is a powerful oxidising agent. The result of such an experiment would necessarily be the destruction of a portion of the organic colouring matter, and the alteration of the rest by the addition of the brown oxide of chromium formed under these circumstances. This is a curious and interesting experiment, but what has it to do with the subject of Dr. Monckhoven's letter? Does he mean to imply or insinuate that the colours produced by alizarine are not permanent, whether on silk, cotton, or as a pigment in oil or water-colour painting, or in the gelatinous image of the pigment print? When informed that the bright red colour of the bandana silk handkerchief and the brilliant tint of the Turkey red on cotton are both produced by alizarine and alumina, anybody can testify to the stability of this matter from his own experience. Every artist will tell us that the madder lakes are the most permanent of known pigments. Does Dr. Monckhoven admit the stability of alizarine lake in the cases quoted, and deny it in the case of gelatine? But why, in the washed and finished print, does there remain even a trace of the soluble bichromate? Is there not complete analogy between the lake diffused through the gelatinous film and that suspended on the vehicle of the painter? I have produced pictures in every tint, from bright cherry-red to black, and I have exposed these for weeks to the action of light without perceiving the slightest change.

Dr. Monckhoven states that he introduced into commerce sheets of cardboard rendered insoluble by wax, &c., but that the public prefer glass. The public ie quite right; such preparations are useless. As soon as immersed in hot water the fluid passes through the wax or other matter, softens the paste, and separates the sheets of paper by which it is formed. It has no such action upon the article I have patented, in consequence of the sheets themselves being cemented by a waterproof compound. It would be a laches on my part to allow this matter to pass by without reminding Dr. Monckhoven that neither the impervious sheets he introduced into commerce nor the glass he alludes to can be used as temporary supports in carbon printing without infringing my patent of 1869.

I am aware that by means of certain representations, the incorrectness of which have been fully shown by disinterested persons, he has formed a subscription to defend the course he has taken. Permit me to tell Dr. Monckhoven that this does not render his proceedings less illegal or injurious to the poor inventor who cannot afford the expenses which the necessary litigation would entail.

I will conclude by appealing to Dr. Monckhoven, as a gentleman and a man of honour, to meet me fairly in this matter. Let us try the question of the validity of my patent, which he has so largely infringed, and has induced so many others to infringe, before a fair tribunal of scientific men—say one chosen by each of us—binding ourselves formally to abide the result. I will say nothing as to the details necessary in such an arrangement, which can easily be settled subsequently if he accept the challenge. If he do not, he must permit me to say for the future that he has not the courage of his opinions.—I am, yours, &c., J. R. Johnson.

39, *Rue Borghèse, Neuilly, Paris, November* 20, 1877.

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Solar Phenomena.—The increased attention which has recently been given to the investigation of solar phenomena, and their possible connection with the changes and periodical deficiencies of rainfall, has induced the Secretary of State for India to sanction arrangements for the photographing of daily views of the sun's disc at some station to be hereafter determined upon in India. These arrangements are provisional for the period of two years, during which time the negatives secured by two daily photographs (where possible) will be sent to England for examination. There is no probability as yet of the establishment in India of a solar observatory, as has been reported.—*Athenæum.*

ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

Notice.—Each correspondent is required to enclose his name and address although not necessarily for publication. Communications may, when thought desirable, appear under a *nom de plume* as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications

G. W. C.—Neutralise a solution of bichromate of potash by the addition of caustic potash.

"Thomas."—The patent, not having been renewed at the termination of the third year, is now the property of the public.

John Brown.—What you require is the *Ferrotype Manual.* It can be obtained from several dealers at a small cost.

T. G.—1. You do not require to announce the fact of registration on every or any copy.—2. For seven years after your death.

J. Schofield would be obliged if any brother amateur would inform him of the best and most portable actinometer for dry-plate work.

One who has Tried.—Why trouble yourself with compressed oxygen when it is so much more convenient to make it at the time it is required?

J. W. G.—We have not yet had an opportuity of instituting a comparison between the three lanterns you mention, but it is far from being improbable that we shall soon have a report on this subject.

Exhibitor.—Not having seen the rejected pictures we are unable to offer any opinion on the merits of yours, which, of course, we have not seen, and concerning the rejection of which we are unable to offer any explanation.

X. Y. Z.—You must have quite misunderstood our meaning, which was that the diaphragm must be placed between the front and back lenses, and at a distance of one inch from the front lens. We cannot make it any plainer than this.

J. T.—All the requisite appliances for cutting mats, having either round or cushion-shaped apertures, for magic-lantern transparencies can be obtained at the establishment of the Sciopticon Company, 157, Great Portland-street, W.

B. C. S.—Photographic object-glasses may, undoubtedly, be made of topaz, rock crystal, or of any similar hard and transparent substance; but, while they would prove very costly, they would also be *greatly* inferior to objectives formed of achromatic *glass* lenses.

W. S. L.—Under the circumstances the *cartes* are good—quite as good, we dare say, as they could have been made by an experienced professional photographer. Had they been taken under more favourable conditions they would, doubtless, have been much better.

Oldhamite.—A quarter-plate portrait lens will answer the purpose quite well; but it must be properly corrected for flatness of field, even though this be obtained at the cost of astigmation. In an exhibition of *painted* magic-lantern slides a high degree of definition is not desirable.

Pylos.—After precipitating the silver, wash it several times to get rid of the nitrate of copper. Give the final wash with distilled water, which pour off without close draining. Now add nitric acid a little at a time, so as not to have too much present; apply a gentle heat, and the precipitated silver will dissolve with great rapidity.

The Medal Awards at the Photographic Exhibition.—In our last we did not give with a sufficient degree of accuracy the name of the gentleman to whom was so worthily awarded the medal for producing the best photograph of a microscopic object. This we now rectify by giving it as Mr. Edward Viles, of Pendryl Hall, Wolverhampton.

P. P. Q.—Since we received your letter we have found what Mr. William Blair stated, eight years ago, on the subject of auxiliary exposures. He said:—"Up to a certain point it is a matter of indifference whether the exposure to diffused light, if properly regulated, take place before or after the plate has passed through the camera, or simultaneously with the exposure in the camera." This will, we trust, be satisfactory to you and your fellow-members.

A. Bennett.—With one exception your formula is good; that exception is found in the total omission of some substance to prevent the image from being formed in the body of the paper. You must try the addition of resins or colloidal substances for this purpose. Each producer of developed prints has his own special mode of imparting brilliancy, and much valuable information on this subject will be found distributed throughout our former volumes.

Cymro.—We do not quite relish the term "blurring" as applied to the effect produced by reflection from the back of the plate, because the term may also with equal fitness be applied to any photograph the details in which have become blurred from any other cause—such as the shaking of the camera by the wind during exposure, the negative not having been in perfect contact with the sensitive paper throughout, or the movement of the sitter. For designating the special defect mentioned the term "halation" appears to us to be more appropriate.

G. S. Hill inquires whether it is possible to make enlargements by means of a magic lantern fitted with a powerful paraffine lamp. To this we reply by stating that if the flame of the lamp be intense, the negative thin, and the amount of amplification not too great, an enlarged negative can be obtained on a bromised collodion film (by the nitric acid process) by giving an exposure of two or three minutes. The sharpness of such a negative will be all that need be required for the purpose. Were the illumination obtained from either a lime light or from magnesium the sharpness would be improved and the exposure reduced.

J. Scott.—We have carefully perused the specification, which has been returned as directed, and are of opinion that the architect has done his part fairly and well. Take care to secure a builder of ability and character.

"Sold."—Under this *nom de plume* a correspondent writes finding fault with us for admitting a letter in our last issue from "Lombardi," which, he says, is a direct puff for the cap and chemicals of M. Scotellari, and which he contends should have been relegated to our outside columns aad paid for as an advertisement. Now this, too, was our own impression when we read Signor Lombardi's letter, and acting upon that *we deleted the whole portion of that letter which had reference to anything of a secret nature.* Our correspondent has evidently assumed that the letter which *we* published was similar to that in a contemporary, and in that assumption has written a letter which, as it does not apply to us at all, we do not publish. We most willingly printed that portion of Signor Lombardi's letter which had reference to the effect of auxiliary exposures, because the subject was introduced to our readers through these pages several yeaas ago, when it was thoroughly discussed in numerous articles; and also because the system employed by M. Scotellari for giving the auxiliary exposure has been recently published [see page 458, *ante*] in this Journal with every requisite detail. Our correspondent will, therefore, see that the subject of auxiliary exposures, even with a Scotellari cap, is one which forms a legitimate topic of discussion by the readers of this Journal.

Received.—J. Schofield. Your letter shall have attention.

*** We are still reluctantly compelled to leave over several articles in type.

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West Riding of Yorkshire Photographic Society.—Those interested are reminded that all pictures, apparatus, &c., for exhibition *at the soirée* must be sent in on or before the 27th instant—if possible earlier—so as to lighten the labours of the hanging committee. Also, that the last day for application for tickets, at the normal price of 3s. 6d., was the 21st instant; after that date the price will be 4s. Tea at 4 p.m. prompt.

South London Photographic Society.—The annual dinner of the members and friends of this Society was held at Anderton's Hotel, Fleet-street, on Saturday last, there being a fair attendance. The President, the Rev. F. F. Statham, occupied the chair. A pleasant evening was spent and the company remained till a late hour.

Black Finish for Brass.—Make a strong solution of nitrate of silver in one dish and nitrate of copper. Mix the two together, and plunge the brass into it. Now heat the brass evenly until the required degree of dead blackness is obtained. This is the method used by French instrument makers to produce the beautiful dead black colour so much admired in optical instruments.—*English Mechanic.*

A Novel Use of Photography.—At the Westminster County Court, last week, a tailor in London sued his customer, a clerk in the employment of a solicitor, to recover the sum of £3 10s. for a coat supplied under the following circumstances:—It appeared that the defendant, when ordering the garment in question, was a resident of the Isle of Wight, and wrote to the plaintiff ordering patterns for an overcoat, and asking at the same time if he could "build" him an overcoat if he sent a photograph of himself and one of the pattern of the coat required, together with a measurement of his height and size. The answer being in the affirmative the coat was made and sent home; but, not being so promptly paid for as ordered and executed, the defendant was sued for its value. The defendant, not denying the coat was a perfect fit, was ordered to pay for it. In giving judgment the judge remarked that this was certainly a new use for photography, and he should imagine it was a somewhat hazardous one on the part of any tailor to ensure a fit by. However, as the defendant appeared satisfied, judgment would be entered in the plaintiff's favour.

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METEOROLOGICAL REPORT.

Observations taken at 406, Strand, by J. H. Steward, Optician

For the Week ending November 21, 1877.

These Observations are Taken at 8.30 a.m.

Nov.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks
15	30·28	W	50	51	56	37	Raining
16	30·23	W	55	56	60	49	Raining
17	30·46	NW	40	41	50	37	Fine
19	29·98	SW	41	43	50	36	Raining
20	29·57	WNW	38	40	46	36	Fine
21	29·82	WNW	38	40	47	36	Hazy

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 917. Vol. XXIV.—NOVEMBER 30, 1877.

ON THE USE OF THE ACTINOMETER IN LANDSCAPE WORK.

The employment of the actinometer for the purpose of measuring the exposure necessary for dry plates in the field has recently received some attention, having formed the theme of discussion at the last two meetings of the Liverpool Amateur Photographic Association, at the first of which a paper on the subject was read by Mr. J. H. T. Ellerbeck. In its general sense the matter is one of the very highest importance to landscape photographers, especially those who confine themselves to the use of dry plates, as the development of a ready means by which the time of exposure may be ascertained with tolerable accuracy would remove at once, perhaps, the greatest objection which can be urged against that class of plates. But, as we approach the subject more closely, and come to examine into the requirements to be fulfilled, and the means at our disposal, we become more and more impressed with the difficulties surrounding what at first sight appears to be an extremely simple matter; and we think our readers will, after devoting a little thought to this subject, agree with us that the best we can do in the direction desired will be to secure an approximately accurate result rather than complete accuracy.

But, considering the variable character of the light, and the diversity in the nature of the subjects with which the landscapist has to deal, and bearing in mind that in forming a judgment of the necessary exposure his calculations are based upon a system of guesswork, it is obviously worth while to adopt any expedient which, in a simple manner, even partially removes the element of uncertainty; and this is undoubtedly the case in the employment of the most simple form of actinometer, inasmuch as it substitutes for the arbitrary determination of the exposure necessary a system founded upon actual measurement of the actinic value of the light. But let it not be supposed that such measurement—or even a much more complicated process—removes all difficulty and uncertainty; such is far from being the case. Much, if not all, is still left to the judgment, but with this difference—that actual calculation takes the place of mere guesswork. As Mr. Ellerbeck justly remarks in the course of his paper, "the judgment is helped, not dispensed with."

The actinometer has long been recognised as a necessary adjunct to carbon printing, and for all purposes connected with that branch of photography gives results upon which the most perfect reliance can be placed. Where, then, is the difference in applying it to landscape purposes? We may reply in a few words. In one case we have to deal with *direct* light, in the other with reflected light; in other words, in the one instance the actinic force registered by the actinometer represents the degree of power actually exerted upon the print exposed simultaneously; in the other, the same light which acts directly in forming the "tints" of the actinometer suffers reflection from a variety of objects differing both in colour and reflective power (to say nothing of the complications introduced by its passage through the lens) before it produces its impression upon the sensitive plate. To what extent, then, it is necessary to carry the exercise of judgment even after securing the advantages of an actinometric measurement of the light will be easily recognised. Further: it may be remarked that an examination of a collection of photographs will establish the fact that the class of subjects which afford the strongest evidence of the necessity for some means of measuring the exposure are those for which the simple actinometer is least applicable; for, whereas well-lighted landscapes presenting but little contrast—comprising, in fact, the class known as "open views"—exhibit but a small percentage of errors of exposure, but few of an opposite character—those including masses of overhanging foliage or shaded ravines—will be found to have been correctly timed.

With these introductory remarks upon the principles involved we will now proceed to consider the practical phase of the question. We start, of course, with a measurement of the actinic value of the light by means of the actinometer, of which there are several varieties, which may, however, for our purposes be reduced to two distinct forms, both of which are supplied by the Autotype Company for use in connection with carbon printing. In one the valuation of the light is made by noting the length of time required to colour the sensitive paper to a standard depth, known as a "tint;" in the other a scale of varying degrees of translucency is employed, each degree having a distinctive number printed upon it in opaque ink, and each "tint" is read off when its corresponding number becomes visible in white on a slightly-shaded ground. For our purpose, no doubt, the former style will be found most generally convenient, though we do not altogether agree with Mr. Ellerbeck in believing that the second form will be useful only in connection with slow processes. It is probable that if, while retaining the general form, a more delicately-graduated scale be employed than is necessary in carbon printing, results of greater accuracy would be obtained with this than with the simpler system.

In connection with the first description of instrument, the chief requirement consists in the preparation of an uniformly sensitive paper for producing the tints; for it is obvious that any variation in the sensibility of the paper must entirely upset all calculations based upon the results obtained under other conditions. This question of uniformity—which affects equally every form of actinometer—can only be satisfactorily met by the most stringent attention to all the details of the preparation. Thus, supposing we start with an uniform sample of albumenised paper, it is necessary to sensitise it upon a solution of silver of unvarying strength—a condition which is plainly not fulfilled if the ordinary printing bath be employed, varying, as it does, in strength with every succeeding sheet floated upon it. A convenient plan is to keep a solution for this special purpose, a measured quantity of which is spread upon the paper to be sensitised (previously formed into a shallow dish by doubling the edges) and allowed to act for a certain fixed time. The solution is then poured off, and not again used for the same purpose. But even this leaves us dependent to a very large extent upon the uniformity of the albumenised paper, and it becomes a question, in order to secure the greatest accuracy, whether albumen should not be altogether discarded, and a special salted paper of known properties substituted. Many operators adopt this system, while others employ plain paper sensitised upon a standard solution of bichromate of potash; but not having tried the latter we are unable to speak as to its probable advantages.

We may notice here a recent suggestion as to the employment of a paper prepared with bromide of silver in place of chloride in order to preserve the correct ratio of exposure under varying conditions of light. We must remark that it does not appear probable that the actinometric measurements obtained are sufficiently delicate to be affected to an appreciable degree by any difference of sensibility between chloride and bromide; and, even supposing such were the case, we cannot see that the use of bromised paper would effect much improvement, as we apprehend that the results obtained by direct printing and by development respectively upon bromide of silver would be as little likely to agree as when chloride paper is used to measure the exposure of a bromide plate.

Another point which is likely to cause some trouble is the colour which the paper takes under the action of light. This, as is well known, may vary from a cold slaty-blue or lavender to pink in the lighter shades, or from purple to brick-red in the stronger tints, according to the state of the sensitising bath as regards acidity, or nature of the salting of the paper. If the colour of the paper should not agree with the standard tint of the actinometer, it is clear that an accurate judgment of the depth of the tint impressed upon the paper can scarcely be formed; hence the final result must be liable to very great variation. It is difficult to remedy this state of affairs, except by strict adherence to a formula which is found by experiment to give the requisite colour, and by preparing a fair stock of paper at once, in order to avoid, as far as possible, the accidental variations that are apt to creep in when small quantities are prepared at different times.

We surmounted this colour difficulty some time ago in a modification of the "tinting" actinometer, which we applied successfully to printing purposes. In place of the ordinary painted screen we employed a piece of glass covered with a transparent orange varnish of sufficient density to preserve the whiteness of the sensitive paper for some seconds in strong sunshine. Upon the under side of this orange screen was pasted a small circle of paper of a faint blue tinge (ordinary blue letter paper of a not too pronounced shade answers well); this, when pressed in contact with a piece of white paper, presented the appearance of a circle of darker colour, or rather a darker shade of the same colour, the actual tint of the circle of paper being masked by the orange screen. In using this, and at the commencement of the exposure, we had plainly visible a dark circle on a light ground; but as the sunning progressed the ground gradually darkened until a point was reached at which the circle disappeared and formed an even tint with the rest of the paper, and could only be with difficulty distinguished by inclining the instrument at an angle, so as to catch the edge of the paper through the glass. This result was identical in appearance, irrespective of the colour given by the sensitive paper, and we thus secured a monochromatic registration of the tint. From the non-actinic colour of the screen employed by us this instrument was scarcely sufficiently sensitive for use in landscape work, or, indeed, in printing in a weak light; but we have no doubt that by varying the colour of the screen and of the paper disc it might be adapted to the purpose in question.

We now come to the second form of actinometer, in which a graduated scale is employed to form simultaneously a number of progressive tints. The scale is formed by superimposing a number of thicknesses of paper or other material of thin, even texture, so as to produce a succession of steps, as it were, gradually increasing in density. As ordinarily supplied for printing purposes these "scales" are scarcely sensitive enough for our purpose—that is to say, they require too long an exposure to produce more than the first two or three tints. By employing a thinner or more translucent material an improvement is readily effected. Thus, by using waxed tissue paper, we have produced a scale which, with one minute's exposure to sunshine, would render from nine to twelve tints, and possibly more; but that was the limit in our experiment. An objection to waxed paper, however, is its liability to become discoloured and yellow in the course of time; but, by substituting thin films of gelatine, either uncoloured or containing minute traces of colouring matter, that difficulty would be overcome and an instrument of any desired degree of sensitiveness produced.

The method of using the scale instrument would necessarily differ from the simpler form; on the latter we note the time occupied in forming a "tint," and we know from previous experiment the number of "tints" required with a given lens and stop, and act accordingly. With the scale we expose the instrument for a fixed time—say one minute—and read off the number of tints impressed on the paper in that time, and, having established a ratio between the various grades of the scale, we form our valuation of the light accordingly. The first form is, perhaps, the most convenient in practice, as it provides for variations in the value of the light during the exposure; the second, however, in a steady light appears to offer the probability of greater accuracy.

But both these instruments, as we have stated in the commencement of our article, fall short of completing the task required; they place us in possession of an estimate of the value of the direct light employed, but they leave entirely to the judgment the calculation of the exposure necessary with different subjects. It appears, at first sight, a simple impossibility to proceed further in the matter by analysing, so to say, the different objects in a landscape, and calculating for each its requisite exposure. This, however, is not necessary; for, if we can estimate the time required to impress the most feebly-actinic portions, the rest, thanks to "latitude on exposure" and development, may be left out of the calculation.

A little instrument for the purpose of aiding the judgment in this respect was introduced some time ago by M. Fleury Hermagis, of Paris. It consisted of a wedge-shaped piece of orange glass divided by lines, and numbered in the direction from the apex to the base; it was intended to be used by holding it between the eye and the object, noting the number of the division at which the thickness of the glass was sufficient to obscure the details of the object. Its application is based upon scientific principles, and, though the theory involved is only partially correct, it will probably be found to give assistance in forming an approximate idea of the exposure. Its utility is, we presume, supposed to depend upon its power of absorbing and arresting the rays of the spectrum—the most refrangible or actinic rays—while the visual rays are transmitted. Thus it would appear at the first glance reasonable to suppose that, if we can form a scale which enables us to define the point at which the whole of the actinic rays are absorbed, we are then in a position to estimate their value; but a little consideration will show that the rays which are transmitted to the eye, and by which the judgment is formed, are those which have the least actinic value, and thus with coloured objects an entirely erroneous impression would be formed. For instance: let two objects, coloured respectively blue and yellow, be placed against a dark background and viewed through the instrument described above, the blue object will become invisible long before the other, though we know that a much shorter exposure would be necessary to impress it upon a sensitive plate.

If, however, we consider that the rays of light which reach the eye consist, to a great extent, of reflected *white* light, independent of local colour, we can see how by measuring the amount of the reflected light we are able with the aid of the actinometer to form an estimate of its actinic value, and in this direction we believe such an instrument as that of M. Fleury Hermagis will be useful. As a modification we may suggest an appliance we have constructed for purposes of experiment, consisting of a cardboard frame into which we slip successive thicknesses of coloured glass, noting the number required to obliterate the details of the object. What colour will be found the most suitable we cannot at present say, having only used orange of such a density that it requires eight thicknesses to render the bars of a window invisible against a mid-day sky at the present time of the year.

The subject of actinometric measurement of camera exposures is worthy of further investigation, and we have no doubt that by supplementing the measurement of the light by an examination of the view in the manner last described such a degree of accuracy may be attained as to remove the present uncertainty which belongs to dry-plate exposures.

PHOTO-ETCHINGS.

Suspended upon one of the screens in the recent photographic exhibition were a number of cabinet portraits which arrested the attention of the spectator on account of the peculiar engraving-like effect of the accessories in each. These portraits were exhibited by Mr. Gutekunst, the eminent photographer, of Philadelphia—a gentleman whose name is associated with artistic excellence in every department of photography—and were entered in the catalogue as "photo-etchings."

The particular effects from which the name is derived are produced by working upon the film by means of a needle point, so as to cut it through in the demi-tints and deep shadows. The portrait itself is left intact—at anyrate, the drapery only is touched, and that sparingly; and in this good taste has been displayed. The effect is precisely what would have been obtained had an untouched figure been wedded, by means of double printing, to a background and accessories taken from a steel-plate engraving.

It is not every kind of collodion upon which such effects can be produced. There are four samples we have tried which refused to yield complacently to the touch of the needle, and tore away as a pellicle; another sample, on the contrary, allowed every touch to tell as a sharp, well-defined line, and even bore the application of cross-hatching, by which every minute patch of the collodion was isolated from its fellow patches. This necessitates the possession by the collodion of two qualities—that known as "rottenness" (a term, however, incorrectly applied, although expressive), and great adhesive power. These qualities were subjected to a much more severe study a few years ago than they are at present, because in several of the dry processes "rottenness" was a property upon which depended success. The test that was applied to ascertain the fitness of any definite sample of collodion for this purpose was the simple one of pouring a little on a plate of glass, and when it had become set pushing it forward with the finger so as to pucker it up, and then trying if it could be pulled out flat again. If it did so it was considered to be too tough and "skinny." A collodion of this kind, although excellent for being used wet, will scarcely answer in the production of pictures to be subjected to the action of the etching needle. To render a negative taken by it suitable for this purpose the film must be coated with a thin, penetrating varnish, which will confer upon it toughness of such a character as to enable it to withstand the action of the needle; it must be tough without being skinny. One film, which tore by the application of the point of the finest needle we could procure, was cured of this propensity by means of a weak solution of Canadian balsam in spirits of turpentine; in another instance, a greatly-diluted alcoholic spirit varnish effected the same purpose. Albumen, gum, gelatine, and other substances will answer equally well in other cases; and, where pictures are to be taken with an express view to being worked upon by the needle, the use of a strong substratum will be of advantage.

We have said nothing regarding the artistic aspect of this method of imparting "effects" to photographs. We can very easily imagine that *scientific* photographers will condemn the whole system as false and unworthy of encouragement, and as one that subverts nature even to a greater extent—if that can be possible—than retouching, of which this is indeed a near relative. We waive this point at present, and merely say that the artist who makes the attempt to produce etching effects upon the negative film must make use of a powerful magnifying glass when doing so, and must have previously made a careful study of the manner in which effects are obtained in line engravings, remembering that every touch of the needle point upon the negative represents a solid black line upon the finished photograph.

An artist of skill and refinement may by deft manipulation add greatly to the art-charm possessed by a picture; but the same photograph, if subjected to unskilful treatment, will only become an unsightly hybrid, degrading to all connected with its production, and to the beautiful art-science by which it has been ushered into existence.

PORTABLE SCREENS *VERSUS* REFLECTORS.

Of late there has been a growing tendency to resuscitate the employment of portable movable screens in preference to the more common fixed blinds or curtains which are, or ought to be, found in every studio. We speak advisedly of resuscitating the method, for it has been before the public now for some years. We have before us as we write a number of the *Philadelphia Photographer*, dated January 7, 1872, in which an ingenious system of light-modification, by means of a screen held in the hand during the exposure, is recommended with the usual fervour bestowed upon new inventions by their owners.

The plan is undoubtedly good in its way. It consisted in the use of a screen which could be held, and its action modified by the motion of the hand, in any required direction, throwing shadow in any part of the face it was deemed necessary, and by its motion so softening off the edges of the shadows into the lights and half-tints as to render the whole effect harmonious. So convinced does the inventor seem of the merits of his notion that he avers he could better afford to lose a thousand dollars a year than to dispense with the use of his screen. This is, of course, a little extravagance; yet it is a fact that a movable hand-screen is capable of being of considerable use under some circumstances. Mr. Kent, the inventor of this form, states that he uses his light "entirely open, and sits his subject anywhere," and gets any effect he wants.

There is one portion of his communication that we feel inclined to dissent from—a point that he claims as an advantage being the very one we should be inclined to think one of the defects of this mode of regulating the illumination; it is where he speaks of the new system being less fatiguing to the sitter's eyes than the old plan. We should have been strongly of opinion that the strain to the eyes, and the temptation to make them wander or follow the moving object, would be so great as to make the use of the screen a nuisance to the sitter, and form an actual impediment to its practical adoption. The method was in various ways improved upon by others, who very possibly saw this objection from time to time, and at last the idea was utilised by a French gentleman, who added improvements of his own and sold for a good round sum a full description of his new screen, with various details of the manner of using it, and a variety of hints upon the control and management of light so as to produce every effect of illumination adapted for photography.

It is obvious that any artist having a knowledge of light and shade could make or have made for him a portable screen according to his fancy, and from his own working plans; and accordingly we have lately had an opportunity of examining more than one such screen so made, and the operators in the establishment they were used in have expressed themselves very strongly in their favour. A reference to our advertising columns will also show that one enterprising manufacturer at least has foreseen a possible demand, and now keeps them ready made. For the screen to be of real use it should combine the three qualities of portability, ready adjustability, and minimum of bulk; and a stand and screen so combined will, we are inclined to think, ultimately be found in most well-appointed studios where careful attention is paid to illuminating arrangements. We are inclined to the use of screen and stand combined; for although the hand-moved screen is so fully under control it necessitates a second helper to uncap the lens, and the objections to a continually-moving screen are very numerous.

The advantage of the portable screen and stand over the usual blinds or curtains is twofold—first, the rapidity with which changes in the mode of lighting can be made; and, secondly, the convenience of having a screen always at hand ready for use in any position and in any place and able to be employed in any unforeseen emergency. It frequently happens that some considerable adjustment or re-adjustment of the blinds are needed before the artist can satisfy himself as to the exact direction and style of light most suitable to a subject being photographed; and as the larger the studio the greater is the amount of blinding to be altered and the greater the amount of time lost, so it is evident some instantaneous mode of producing the same effect with an equal, if not greater, amount of nicety must be of considerable help on occasions when time presses, and, indeed, at all times, for the shorter the period the sitter is kept waiting the better is it for his expression and general amiability.

If the arrangement be provided with a semi-transparent and an opaque screen it would give considerably more power to the operator. We should think a movable arm, somewhat after the fashion of a windmill sail, would be the handiest form. A pair of stands, one on each side of the sitter, so made as to give power to use both kinds at once upon the same sitter, would, we could easily believe, be the very acme of luxurious lighting. For the semi-transparent screen nothing could be better than one or two thicknesses of the tracing-cloth we spoke of a few weeks ago in one of our leading articles.

For occasional use in unexpected contingencies we can easily see a great number of cases where it could be of considerable service. In groups where one face received a greater proportion of light, and so would require less exposure than the other, the semi-transparent screen would be found a useful help. Sometimes a stray gleam of sunlight creeps into the best-arranged studio, and requires a vexatious amount of pinning up of paper and of general "dodging" before it is got rid of. Again: it may happen that a sitter may come who requires an unusual amount of top light—such, for instance, as one whose eye cavity is but faintly marked, but with whom side light cannot be entirely dispensed with—or an extra gleam of light from a bright cloud low down on the horizon may fall upon a face and interfere with the first illumination already devised; these, and a multitude of other occasions, will occur to the thinking photographer to show the usefulness of movable screens.

It must not, however, be thought that we advocate the disuse of the old familiar friends, the blinds and screen; or that we think portable screens will render them useless. Far from it. They would be required as much as ever; for it must be perceived that the movable screen can only be used for what we might almost term points of illumination. It cannot touch the masses of light and shade; it can only be applied to small portions of a figure—the face, the hands, a portion of the dress, &c., &c.; and the general effect of light and shade throughout the entire picture, be it a half-length only or a full-length figure, must still be sought for in the judicious setting of the large blinds. We quoted Mr. Kent's opinion at the outset, but we must not be judged to endorse it. He puts his sitters "anywhere" and uses the full, open light. But, with the most dexterous management of his screen, how could he arrange the light on the dress to avoid flat, grey blacks and glaring whites in projecting parts, and general want of tone, though he took no more than a half figure? We cannot in any way recommend the use of a screen without other aids. We repeat, to reap its full, or indeed the chief, advantages of its use it must be used in conjunction with a disposition of general blind arrangements directed by artistic taste and judgment.

THE REFULGENT LAMP.

Under this name a lamp has been recently introduced for burning paraffine or similar mineral oil. In its general features it resembles that of the sciopticon; that is to say, it possesses two flat wicks placed side by side in a slightly angular position. The lamp itself, which is formed of metal, is one large combustion chamber, from one end of which the light is emitted, and the flame is made to stand "end on" in relation to the condenser.

We do not intend here to institute any comparison between the circular and flat wicks as applied to lanterns, our sole object being to give an account of certain improvements in the Marcy sciopticon lamp, for which Mr. Newton, of Fleet-street, has taken out a patent. These details are obtained from the twofold source of an examination of the completed specification and also of the lamp itself, which we have seen subjected to a thorough trial. The specification claims our first attention, and in what follows the reader is supposed to have his mind's eye fixed upon the sciopticon lamp.

Setting forth in the preamble the necessity for having the ends of the combustion chamber properly closed, so as to prevent smoke, and alluding to the glass plates by which such end has been hitherto effected, Mr. Newton says that, in practice, these glasses are exceedingly liable to be cracked and destroyed by the great heat to which they are exposed. In the first part of his specification the object intended to be secured is a method by which to prevent these glasses from being broken by the heat. To accomplish this he proposes to dispense with the back glass altogether, and puts a metallic reflector in its place, in the centre of which is made an eye-hole provided with a small glass, through which the operator can see the flame. If the reflector be dispensed with the end of the chamber is to be closed by a plate of metal, and a similar aperture is made in the centre thereof, and closed by a piece of glass, talc, or other transparent substance, so that the interior can be seen through the aperture; or the end may be closed entirely, and a slight aperture made in any other part of the lamp casing.

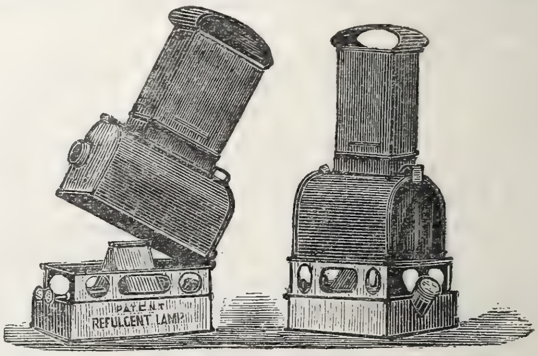
It has, the patentee asserts, been found in practice that in the ordinary lantern the destruction of the glass ends of the lamp casing is occasioned by currents of hot air which, as they rise from the flame, are directed by the under side of the top of the case in a horizontal direction, and made to impinge on the top part of the glass plate, which, being thereby suddenly over-heated at that particular part, will be apt to crack or fly. In order to prevent this Mr. Newton adapts to the under side of the lamp-cover and at the open end where the glass plate is placed metal stops or a metal flange, which will prevent these currents of hot air from impinging on the glass ends. The currents of hot air being thus broken up, divided, or dispersed by striking against these stops will not injuriously act on the glass plates.

In order still farther to cause the currents of heated air to diverge from the horizontal line he makes one or more holes in the top of the casing just behind the glass; the air by rushing in from the outside mingles with the heated currents of air and breaks them up.

A large portion of the specification at this point is devoted to an explanation of the drawings by which it is illustrated, and which we do not here reproduce, for the twofold reason—that the specification and drawings not having yet been printed we have not, consequently, easy access to them; and, further, that from the details here given the leading peculiarities will be quite well understood without their reproduction.

The special claims made by Mr. Newton are as follow:—The construction of parts herein shown and described for the purpose of keeping the several parts of the lamp cool and preventing the heat, or heated currents, from impinging upon and breaking the glasses, as above described. He claims particularly the projecting flange or stop for deflecting the currents of heated air and the holes made in the top of the lamp casing for the admission of cold air from the outside, so as to break up or disperse the currents of heated air. He further claims the adaptation to the top of the wick-tubes of horizontal flanges; also the closing of the back part of the lamp casing by means of the metal reflector instead of a glass plate, as heretofore.

As we have said we have made a careful examination of one of the lamps. We append two drawings, one of which shows the lamp closed up as it is when in use, the other having the upper portion raised up so as to show the wick tubes. The light, when paraffine oil is used, is singularly pure and white, and possesses a degree of intensity that renders it most valuable for showing photographs in all their minute detail and fine gradation, the purity and whiteness rendering it equally excellent for exhibiting colours in all their true effects.



The utility of the perforations in the lamp casing for the admission of cold air was shown by holding a smouldering and smoking piece of brown paper outside, the smoke being drawn inside through the holes, and seen to mix with and dilute, so to speak, the current of heated air inside in immediate contiguity to the glass cover of the end of the chamber.

With reference to Mr. Thomas H. Wainwright's suggestion, respecting the change of colour in bromide films when submitted to friction, we may say a word or two. We are perfectly well acquainted with the peculiarity mentioned in connection with "coarse" emulsions in depositing the larger particles of bromide, and showing a different colour by transmitted light, but we fail to see the analogy between that and the change of colour by friction; at least, we cannot see how the fact *proves* the correctness of Mr. Wainwright's hypothesis. We are free to admit that the removal of the coarser particles by friction may be a partial cause of the change; but, if we accept the suggestion in its entirety, we must assume that the coarser particles ascend to the surface of the film, leaving the finer ones next the glass, though in the emulsion the coarser particles gravitate to the bottom, leaving the finer in suspension. Again: how does it explain the fact that if a very fine scratch be made on the film it will be found, after friction, to be filled with abraded matter of the new or orange colour? Is it that the coarser particles, upon removal from the film by rubbing, lodge in the crack or scratch, and, though previously of a violet colour, change to orange without changing their state of coarseness? No; we decidedly think that the theory of reduction to a state of finer division offers the greater probability of truth, though, as we have said, concurrently with that change the removal of some of the coarser particles may occur, though between their removal and reduction to a finer state there must be some difficulty to decide. *Apropos* of the emulsion mentioned by Mr. Wainwright we have frequently found that, if a coarse emulsion be allowed time to fully deposit its bromide, the liquid portion is found to be permanently coloured a brown or ruby tint—not by particles in suspension, but by matter in solution, even though no organic addition have been made after re-solution. A finer and workable emulsion will, under the same circumstances, be totally uncoloured. Here is another nut to crack.

ON A METHOD OF MASKING AND INTENSIFYING NEGATIVES.

It not unfrequently happens that, after fixing and drying a negative or after varnishing, it is found to be insufficiently dense, either from misjudgment of the effect produced by the intensifying solution, or from a too great lowering action on the part of the fixing agent. In my own case I recently experienced this difficulty, owing to the use of cyanide in place of hypo. for the removal of the unaltered bromide. Hypo. is much preferable, in my opinion, to cyanide as a fixing agent for bromide plates, and I invariably use it for the purpose; but on the occasion to which I refer—being away from home, and availing myself of the kindness of a professional photographer in allowing me the use of his dark room for developing—I found cyanide ready to hand and used it, with the result that several of my negatives, when dried and varnished, are thinner than they should be. I am somewhat loth to meddle with a negative upon which I set any value after it has been varnished; hence, instead of removing the varnish and re-intensifying in the ordinary way, I have endeavoured to avail myself of some of the expedients recommended for giving what I may call an artificial intensity to the image. In the course of my experiments I have tried nearly all the plans I have come across in back numbers of the Journal and Almanac. Perhaps a brief account of one of the methods which has given the greatest satisfaction in my own hands may be of use to others.

The method to which I allude was originally communicated by Mr. William Brooks to the South London Photographic Society, and an abridgment of it is given in the Almanac for 1876. It consists in the production of a paper negative upon albumenised paper, which is so attached to the original negative that the various parts coincide, and thus produces a great accession of density in those portions where an image already exists, and in proportion to the strength of the original deposit. But, in addition to this, the method affords very great facilities for introducing or strengthening details or shadows by working—either on the paper negative or positive on from which it is produced—with a lead pencil or Indian ink; also, any portions which are sufficiently dense in the original—as distant hills in a landscape—may be removed from the paper negative by the application of a suitable solution and a bolder effect produced.

My mode of procedure differs but little from that given by Mr. Brooks. I use an eighty-grain bath, but instead of *floating* the paper I *immerse* it for a shorter period than I should float it in the ordinary manner. In printing I carry the operation as far as I can without burying the feeble details, and tone and fix in the usual manner. At this stage if any portions—the foreground, for instance—be flat or heavy the shadows may be strengthened with lead pencil or otherwise, so as to produce greater vigour in the auxiliary negative. This operation is not so difficult as it might appear, and requires no very great mastery of the use of pencil or brush. Any effects so introduced will be subsequently softened or diffused by the intervention of the thickness of the glass in printing, for the paper negative is attached to the back of the glass one. Having touched-up the print it goes again to the printing-frame, but this time performs the functions of a negative; paper prepared in the same manner as just described is used, and the printing to such a depth as may be judged suitable. The negative thus obtained may be again worked upon with the pencil if necessary. If there be a lack of detail in any foliage portions the touches of light which indicate the shape of individual trees may be boldly sketched in, care being taken not to make the touches too heavy.

If the distance be dense enough on the original, brush it over in the paper negative with a strong solution of chloride of copper, which will immediately bleach it. This may be followed with hypo., but I do not consider it necessary, as the bleached portions do not colour under the action of light, though they may probably retain a bluish tinge from the copper solution. If there be an outline of any sort in the middle distance at which to break the wash all will be easy; failing this it will be necessary to slightly shade off the edge with a pencil in order to avoid harshness.

The paper negative is then ready for attachment to the glass. In order to effect this it is immersed in water and allowed to become perfectly limp and pliable; the glass negative then receives an edging of strong glue about a quarter of an inch wide, and on the reverse side. This will set rapidly, when the paper *cliché* is pressed between folds of blotting-paper to make it surface dry, brought with the albumen surface in contact with the bare glass, manœuvred into position, and finally the edges rubbed down into intimate contact with the glued edges and left to dry. It will then be found stretched tight and smooth in contact with the glass. In order to facilitate the correct "registration" of the two negatives it is well to trim the first positive to the exact size of the negative, using the latter as the cutting guide. If the second printing be done upon paper slightly larger a dark margin will result, and in bringing the two negatives into contact this may be taken as the guide. Slight variations from absolute coincidence do not appear to materially affect the result, owing to the diffusion which occurs in the passage of the light through the glass.

Last of all, any portions which appear too dense in proportion to the remainder may be waxed or treated, as Mr. Brooks recommends, with a solution of castor oil in ether. If, however, on taking a print the negative appear to be harmonious the whole may be waxed, which will cause it to print with greater rapidity without affecting its general qualities to any noticeable extent.

In conclusion: though upon paper this method may have a roundabout appearance in practice it will be found extremely simple, and has the advantage of requiring no special appliances or manipulations. I have found it so useful that I thought it worthy of being disinterred, and once again introduced to the notice of the readers of The British Journal of Photography. W. B. Bolton.

RECENT IMPROVEMENTS IN CARBON PRINTING.

The announcement of Mr. J. R. Johnson's recent improvements in carbon printing has given me great satisfaction, though I must also confess to a slight feeling of disappointment at finding myself forestalled. However, these coincidences are so common in photography that one ceases to be astonished at them.

For some time past I have been working in a similar direction, and the state of my health has alone prevented me from publicly ventilating the subject earlier. I had satisfied myself months ago that the method of coating the developed print with opaque or translucent gelatine was a good one, and intended adopting it for all my future small work.

As to the other grand point in Mr. Johnson's specification: I have for a long while been thoroughly convinced we should never get a perfect carbon print until our tissues contained either a graduated film or two or more layers of gelatine containing a different amount of pigment. With the ordinary homogeneously-prepared tissues I have quite failed in rendering the delicate atmospheric effects in some of my landscape negatives. The tissue which apparently perfectly registered every gradation in a portrait proved quite inadequate when used for a delicate sky. The thinnest layer of the coloured gelatine which it is possible to obtain is too thick (or, rather, contains too much colour) to render the faint tones which we ought to get in a good sky picture, and which we do see in a first-rate silver print.

It must have occurred to many thoughtful workers that the only way out of the difficulty is to have a coating of very slightly-coloured gelatine on the surface of the tissue, so that the most delicate half-tones might be rendered by it, whilst the more forcible tones would be represented by the more strongly-coloured gelatine below.

In the very early days of carbon printing I worked out a method by which prints in two or more colours were produced by using superimposed layers of variously-coloured gelatine; and it had often occurred to me since that some modification of my early method would be useful for the more perfect rendering of a negative in monochrome. The curious in such matters may find a short article from me on the subject in the photographic journals for July 22nd, 1864. But, if Mr. Johnson's new method of preparing tissue be practicable on a large scale, it presents some points of superiority over the plan of using more coatings than one of gelatine.

From Mr. Johnson's proposed method of preparation it will be noticed that theoretically we obtain a gelatine film containing a perfect *gradation* from the finest to the coarser particles of colour, instead of having definite layers, which will, doubtless, be a very great advantage. The superiority in this way of Mr. Johnson's plan must be so patent to everyone that I need not enlarge upon it; and I am pleased to take this opportunity of congratulating Mr. Johnson on the great step in advance which he has just made.

In concluding I would, however, suggest that the plan of successively coating the paper with two or more layers of gelatine might also be useful. It would enable us to have the tints altered, as well as the amount and quality of the pigment. For some subjects a fine effect would be produced by having the half-tones of a cool tint, whilst the deep shadows might be enforced by a warmer colour, or *vice versâ*.

Whilst engaged in experiments on Wothlytype printing I obtained many pictures in which this effect was produced; and it is so effective I should be glad if we had the means of imitating it in a more permanent process. HENRY COOPER.

P.S.—Since writing the foregoing note I notice some remarks by "Free Lance," in the last number of the Journal, on the new patent, and in consequence thereof I pen this postcript to assure my readers I do not for one moment wish to detract in the least from the value and originality of Mr. Johnson's new methods. As an enthusiastic experimentalist with carbon for many years, I feel somewhat better qualified than some whose acquaintance with it is of only recent date to appreciate the results of Mr. Johnson's labours. He has done so much for the success of permanent printing that I should deeply regret any remarks of mine on the subject being misunderstood.—H. C.

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PHOTOTYPIC ENGRAVING.

GENERAL REMARKS.

THE art of printing by means of fatty inks is making rapid progress, and the effects produced are complete and satisfactory. It has been perfected and rendered practicable in a very highly-artistic sense by M. Albert, of Munich. By this method of obtaining impressions it is very difficult to work rapidly and produce proofs that are better than those obtained on albumenised paper. At the present time the proofs produced by this process are not inferior to those produced by any other photographic process. The principal faults which present themselves in the Albertypes or phototypes are sombreness of the tones, the blacks not being brilliant and the whites not pure, and, in their stead, a general ashy tone.

We have long thought it would be a very difficult matter to establish a process that would successfully rival the engraver's art, but we have at last a method of engraving on copper plates, and according as the plate is lightly or deeply cut the effect, when produced, will be similar. We do not pretend that we have arrived at such a state of perfection as to surpass engravings, but we can produce work equal to them. We can show some phototypic proofs where the most beautiful blacks add their effect to a mellow colour without being hard and patchy in the whites. The contrasts are generally more subdued than in those which are produced by hand, and in which the artist has the power of forcing the effects of nature; but we can make the relief appear very solid and well-pronounced.

How are these effects obtained? This question is rather difficult to answer absolutely. If we observe the facts attentively we will notice that a film of gelatine gives very fine details, and is vigorous in the shadows and brilliant in the whites. This film, after it has been placed in water and desiccation is complete, becomes slightly granulated according to the action of the light; the action is continued until the grain is sufficiently marked. At the time of inking this surface is covered with a greasy ink coloured so as to present a pure, delicate, and energetic image, as will appear on the paper after the impression. If, on the contrary, the image is grained with deep hollows representing the blacks, we may be certain that the resulting pictures will be vigorous. If, however, we attempt to overcome the greyness of the tint by inking deeper the result will be a heavy black, wanting in detail. The impression will not have the desired effect unless the ink is spread regularly; and for this purpose a machine roller, however quickly it may travel, is much better than several applications of a hand roller. After the phototypic plate has been inked a considerable number of times the natural effect produced by the light is materially altered.

We have remarked that when inking with a machine roller it is sufficient to pass the roller over the plate once only in order to obtain all that is requisite. If the inking be applied a second time before the impression a very thick picture will be the result, the effect of which will be very disagreeable; and the same will result if the ink be applied to the roller too thickly.

The following particulars with regard to the gelatine should be noted:—1. The thickness of the film. 2. The temperature obtained during the mixtures of gelatine, isinglass, and bichromates of potash and ammonia. 3. The temperature of the stove. 4. The age of the preparation used. 5. The time between the gelatine in a liquid state and when insolated. If the foregoing are not carefully studied it is impossible to obtain good results.

The heat of the atmosphere in the stove should be about 89·6° Fahr. If the heat be too high it is injurious, and the result will be that the gelatine will assume a pappy character not capable of receiving a fine grain. The stove should also be well ventilated.

We do not know of any photographic means whereby a negative can be so well reproduced as by the phototypic process. The negative should be neither too harsh nor too soft. It is necessary that the negative should be tolerably transparent in the lights. The formulæ for phototypic films vary according to the fancy of the operator.

We would like to see this process brought more into everyday use. In France there are only two firms that work the plates by means of machine rollers, and five or six that work with hand presses. We should all attach great importance to this art, and I feel convinced that there is still a field open for explorers. LEON VIDAL.

—*Le Moniteur de la Photographie.*

(To be continued.)

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SIMPLE EXPEDIENT FOR SECURING DIAPHRAGMS.

AN annoyance I have often experienced when working out of doors with lenses having loose stops has been the tendency of these latter to drop out of their places in moving the camera from one point of view to another.

This accident is the more likely to occur if the lens is so screwed into its flange that the opening for the stop is inclined from its proper position. With lenses screwed into their proper flanges this should not be the case, as the latter are fitted to the camera front with a view to the perpendicular position of the diaphragms. When, however, an adapter is employed the lens, if screwed home, often does not assume the proper position with reference to the stop. This defect might be remedied by unscrewing the lens a portion of a turn; but the better plan is to employ an india-rubber band as a safeguard. A slit in the band allows it to be drawn over the projection of the stop and round the tube of the lens.

This band answers a double purpose: it secures the stop in its place in any position of the lens, and prevents the access of diffused light to the plate through the opening for the diaphragm. Recently I had a number of plates fogged from this cause, which I detected when examining the interior of the camera for cracks in the hollows—the suspected part. J. D. LYSAGHT,

Lieutenant 102nd Royal Madras Fusiliers.

ON THE SPLITTING OF NEGATIVE FILMS.

The preservation of negatives is a most important matter, especially if taken with a view to publication or if large numbers of proofs are required. Negatives that have been laid by for some years after being proved may, in these days of change and mechanical printing, become valuable for some purpose unanticipated when they were made. In such cases, how excessively annoying is it to find, when unboxing them, many split and damaged with yet their bloom of newness unimpaired! This condition is not only possible but probable if the right sample of collodion is used and the temperature nicely varied, aided and abetted by a certain amount of humidity.

I am induced to remark again upon this subject by reading a communication from Dr. Mantell, who has, unfortunately, met with some disagreeable experience of this kind, but who, I am inclined to think, has somewhat mistaken the cause in attributing *all* to *damp*. Having the opportunity of seeing hundreds of negatives in all stages of cracks and damage, knowing also how they were made, and the great care used in all the processes through which they had to pass—having, in fact, given much attention to this particular subject, tracing the faults and applying the remedies—I feel perfectly satisfied that the especial kind of *wavy* cracks do not proceed from damp, but from the use of a collodion of a too contractile nature. Damp is, doubtless, a dangerous enemy to negatives as it is to most other things; but it is impossible for damp to cause *contraction* of the usual negative, varnish-protected film.

The manner in which damp exerts its baneful influence is by causing unequal expansion, raising the film into ridges and causing it to leave its glass support, making cracks of a different character (angular, but never wavy) to those fissures produced by unsuitable collodion, which, upon examination, will be found to have considerably contracted, occupying as much less space upon the glass by the aggregate amount of the width of the cracks than it originally did. Whatever cracks are caused by damp must necessarily be by absorption, and a film having absorbed moisture would evidently not occupy *less* space than before. Now variation of temperature will alternately contract and expand a compound film (*i.e.*, varnished negative); and if the layers of collodion and gum resin in intimate adhesion are unequally affected, the natural consequence is the less elastic splits, destroying its neighbour at the same time. Most collodion makers bear this in mind, and so constitute their collodion that it will adhere sufficiently firm to the glass support, so that a moderate amount of moisture and change of temperature will not injuriously affect it. I have seen an apparently perfect film crack when being merely removed from one room to another of a lower temperature without the intervention of any damp whatever.

I can put my hands on hundreds of negatives fixed both with cyanide and hypo., but chiefly with cyanide, in this horribly disfigured condition—negatives that have been most carefully prepared and thoroughly washed, so that no soluble salt could take part in this breaking up, and whose destruction I have traced to nothing more nor less than the quality of the collodion used. By the use of this collodion I can ensure cracks at any time in a few months by slight variations in temperature, and they invariably assume the same form; whilst with another sample, such cracks *cannot* be produced with the most careless treatment to which a negative is likely to be subjected. The best and most reliable guide to the selection of collodion in this respect is to notice its behaviour in the nitrate bath. If it *easily* slip from the plate when carefully manipulated the chances are that the resulting negative will split. Albumenising the glass is an excellent plan, and will help to remedy matters; but my advice is to avoid such collodion, as it may be inconvenient at times to use albumenised glass. For my own part, I have used one popular make of collodion for many years and never had a single case of wavy cracking.

To remedy the raised cracks: submit the negative to the vapour of alcohol in a covered dish for an hour or two, or till the raised portion lies flat. When the varnish has once again set the negative will be as serviceable as ever, care being taken not to break the film in any attempt to press it flat; the vapour of the alcohol will do that, flattening it without any further assistance. Edward Dunmore.

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THE ART OF PAINTING ON THE PHOTOGRAPHIC IMAGE.

No. XIII.

We will now suppose that the painting is pretty well covered in all over. It must be allowed to dry for a day or two; then, taking a sharp knife, remove any very obvious or unpleasant roughnesses. This should not, however, be overdone, especially in the impasto passages; the brush-marks should be left a little. A slight degree of roughness in the high lights produces a luminous effect difficult, if not impossible, to get with paint laid smoothly on. The reason for this is that the little prominences of colour catch the light. Besides this, flesh is not a smooth surface like alabaster, but a soft, yielding, palpitating substance; and, as a plea against hardness, let me remind the reader that *it is covered all over with a fine down.*

I now feel that I have approached the most difficult part of my task, namely, to describe without the personal presence of my indulgent reader, and with a half-finished oil picture before me, the method of the second painting. Indeed, I suppose no two cases can be treated alike; but I will do my best, feeling tolerably sure that I shall make myself at least as intelligible as those who rush into the subject with greater confidence and more words.

First breathe on your picture, and if the mark of the breath disappear quickly it is dry. Then take a piece of wash-leather, dip it in water, and squeeze it about as dry as you can with your hand; with this rub your picture all over and wait until dry. Now take a large brush and thinly coat the picture with a little pale drying oil, or, if not too thick, with the medium I recommended in the first instance. You will find after this treatment that every touch will go on "kindly" and become incorporated with the ground underneath. I have known artists complain that the use of the medium for this purpose softens the ground too much, as it contains turpentine; but I find this rather an advantage. As, however, it is a trouble to some artists I thought it better to mention it.

Just examine the face and ask yourself—"Does it look too pinky in general tone or too yellow?" If the former—as will most probably be the case—take some medium *slightly stained* by the admixture of a small quantity of raw umber and pass it all over the face except the whites of the eyes. This will have a wonderful effect in "pulling the picture together" and harmonising the tints. If you wish a very fair complexion, or if it already look too yellow, a like transparent glaze of rose madder or vermilion, or the two mixed, will be found useful.

Now take a little raw sienna, white, and Venetian red—but not so thick as the first impasto—and go over the high lights; then glaze the shadows with appropriate tints—the warm deep shadows with glazes of pure raw umber or pure Indian red, or the two mixed, according to circumstances, which can only be learnt by experience; or try first one and then the other, wiping them off between each trial with a piece of rag. Should any shadow, deep or medium, look too hot, if not also too dark, a glaze of terre verte will probably make it right; or, if it be too dark, a scumble of terre verte with a little white may be passed over it. A glaze of terre verte may be carried over all the places that should be pearly, such as the temples, the roots of hair, and round all hot, deep shadows.

Joseph Wake.

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NOTES FROM AMERICA.

We regret we have for some weeks been unable to resume these "Notes." In Connecticut trade prospects were not at all bright a short time ago, but from the report of Mr. E. T. Whitney we are glad to see that a marked improvement has taken place, the crops in the West being "simply immense." Mr. Whitney's ideas concerning styles, prices, lighting, and other matters will be ascertained from the following extracts from his letter:—

> Regarding the styles most in demand, I will say unhesitatingly that with me the cabinet vignette is the most called for. I have consulted leading artists in New York, and they concur in the same opinion; but there is a growing demand for promenade and composition pictures. That there is not a greater sale for the latter styles may be owing to laziness on the part of photographers. Regarding prices: my prices within two years have been reduced to $10 for cabinet and $4 for *cartes de visite*, formerly $12 and $5 per dozen. My experience is that good prices ensure not only first-class people (in plain words, rich people), but a class of customers of both sexes who spend money freely, and will have only the best. I find a decided improvement in the taste of the public, and they appreciate good work. It is a source of regret to me, and it must be to many others who love the art and aim high to attain perfection, to find leading men in New York so weak-kneed as to reduce prices one half—men who have been prominent in our conventions have brought a lasting injury to the business. You ask what sort of light I use. In answering this some may say—"Well, he must be old fogyish to use a light invented thirty years ago;" and yet it is true, and, what is stranger still, this is the standard light of the present day; but how few know or have ever heard of the inventor, the late M. M. Lawrence, one of New York's oldest and best daguerreotypists. But to the light. Starting two feet from the floor, rising six feet perpendicular, then sloping at an angle of forty-five degrees, twelve feet, width twelve feet.

With this light groups of ten or twelve can be taken in fifteen seconds. In taking pictures of children I place them within two feet of the side window, and get them in a flash. In making shadow pictures I shut off all top light, place the subject opposite the centre of the side light, and by careful adjustment of screens produce good effects in about fifteen seconds; working from the centre, by having two backgrounds, plenty of depth at either end of the operating-room (which is forty feet long), the canvas can be rolled to either side according to the drawing of the face. Should the subject have a crooked nose, of course you would put the crooked side towards the side light, leaving the best side in shadow. There has been much discussion, and many false ideas advanced through the journals, regarding blue glass for skylights, and one great reason why it has not been more thoroughly used is owing to the difficulty of obtaining the proper shade. About twenty-one years ago I was troubled with weak eyes, owing to the use of cyanide of potassium, and it struck me that blue glass would relieve my eyes as well as the sitter's, and if it would not retard the operation it would be well to adopt it in building my new light at Norwalk. I consulted Mr. C. C. Harrison, the well-known instrument maker, and he said that it would accelerate the production of photographic pictures. The glass could not be obtained in New York, and Schenck and Downing sent to England for it. When it arrived it was a beautiful shade of light blue, ground on the inside; this I have used for twenty years, and would recommend it. This was the first blue light ever used for photography, but the credit is due to Mr. C. C. Harrison.

Wisconsin has an able representative in Mrs. E. N. Lockwood, whose opinions will be received with interest.

In Winconsin we are not dead, neither do we sleep, but are busy in our efforts to convince people photographs *must* be had if "times are hard;" and we have partially succeeded, for business has been very fair, and promises to be better this fall than for several years past. We are having quite a demand for large portraits, mostly in Indian ink, which command prices from $15 to $50 each. We still retain our prices of $3 to $4 per dozen for cards, the size of head determining the price. Cabinets and promenades $4 and $4.50 per half dozen, or $6 per dozen. 4-4's we charge $4 for first copy, and $1 for duplicate, or make three for $5, which is the usual case, and gives us a still better chance to sell frames. Our prices are higher than any other artist charges in this place or adjoining towns; but we will charge enough to do justice to our work, and make enough to keep as well-furnished and equipped a gallery as can be found in the West, and, by taking extra care to give the *best position* to bring out every good point of feature and character in all faces, and modify the bad points, we suceeed in giving good satisfaction and drawing customers from far and near. Every day we have more or less calls from strangers, and people just spending a day or so in this place, who "have heard of the gallery and could not leave town without calling;" and they seem to be charmed with everything about the rooms, and speak of its being so different from any other gallery. We have proved that it pays to keep a nice gallery, and furnish it in such a way as shall impress the public that they are in an *art* gallery, and the proprietors understand their business and keep up with all the improvements in our art. I *know* that people are willing to pay more for work when their surroundings are pleasant enough to reflect some animation in the shadow of their face than to sit for a picture where the ladies will gather up their dresses to keep out of the dirt and filth on the floor, and feel like dusting the chairs before they can sit down. I believe it is impossible for a person to have a happy expression in such a place while sitting for a portrait. A dirty gallery and low prices go hand in hand. If you cannot do good work enough to command a good price, which will pay to keep things in good taste and order, *do* let the business alone; this is my advice to every one. We find that our patrons, far and near, are becoming educated to know what constitutes a nicely-finished picture, and the demand is increasing for composition pictures, though the most we have to work for seem to prefer a fair-sized head, either printed full or shaded vignette, in preference to fancy backgrounds and full-length figures. We use a very steep north skylight and side light, and are never troubled with sunshine, but have a very uniform light, working quickly. I believe the time has come when *good work* can command *good prices*, and success alone depends on these two things, combined with order, cleanliness, and taste in the arrangement of galleries.

It is gratifying to find, from the report of Mr. H. Rocher, that business prospects in Chicago are somewhat encouraging:—

Business, he says, is at present what it always is in the summer months, not very brisk, but whatever there is shows signs of appreciation of good work, and, more so, appreciation of our endeavour to give our patrons something which will rarely fail to please. The styles of pictures mostly sought for at present are cabinet and promenade, full and three-quarter figure, less bust, and very few *cartes de visite*. The imperial, as I have introduced it at the Centennial, seems to become quite a favourite picture; it takes sometimes the place for an order of a larger picture, whereas this dozen ($30) is no more than would be charged for one large portrait. In regard to the taste of the public: I will say that one or two years ago I often encountered difficulties upon showing the public what we call our "composition" pictures. Many at that time were too much accustomed to the old stereotyped photographic pose, but now it can be plainly observed that not one out of a hundred want this old-fashioned pose, but gladly accept what I think proper to make for them. There is no more objection made to a given pose, particularly in the full-figure picture, and I may fairly call this a great step forward and onward in the way of improving public taste. It is evident that in the way I work more care is taken in the composition, and, consequently, more time is spent than is done with ordinary poses, and it further follows that I charge for my work accordingly. The prices at present are:—for cabinet, $12; promenade, $15; boudoir, $22; imperial, $30 a dozen. Single pictures from 4-4 upwards:—4-4, $6; 8-10, $10; 11-14, $15; 14-17, $20; 17-20, $30. It is at least cheering to say that no objection is made to my prices, which, in fact, I have never found the necessity to lower, and never will. I do not believe cheap prices help the reputation and business of a photographer of any pretension; nor do I believe in working for nothing. My light is a pure north sky and side light, with plain glass and blue curtains. It pleases me very much, and having full control over it by means of my system of blinds I can produce any conceivable effect under the same.

The cheering, or at least hopeful, anticipations of the former writers are not shared in by Mr. J. Perry Elliott, of Indianapolis, Indiana, whose report contrasts strongly with theirs:—

The prospect for business during the coming autumn is decidedly gloomy, though it would seem that the immense crops raised in our State and elsewhere ought to make times better, but at present business is the worst I ever saw. I find ferrotypes the "style" that most persons call for these times, though if money was not so scarce their "tastes" might manifest themselves in another direction. My prices for cards and cabinets are $3 and $8 respectively per dozen. I have a north top light, about ten by twelve feet; side light in centre, only about half so wide, and running nearly to the floor; plain backgrounds, mostly for *cartes*, and also for larger sizes, though occasionally a customer prefers a patent "Bendann" printed in. I have no experience with "composition" pictures. I only regret that I cannot give a more cheering report, but things look decidedly "blue" at present, and the immediate future promises little better. The outlawry of the past two weeks or so has given business a setback from which it cannot soon recover.

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THE TONING SOLUTION.

There is no part of the printing process less under control than that of toning the moment the conditions are once changed; that is, the moment you get your gold salt from another house change your formula, remove to another location, or finally begin to manufacture your own terchloride of gold. This is changing the conditions, and is in like manner a changing of results; and, generally, it is a change for the worse. From this it may properly be inferred that if anyone is already master of a regular system of toning which never fails to give satisfaction and is quite under control, such an one ought to be satisfied and not dabble with experiments in search of something better. The observations now presented are not intended for adepts, but for those who still fail more or less in the toning process, or for those who are beginning, or, in fine, for those who deal with a variety of dealers, and thus are not furnished with gold of uniform strength and quality.

I have examined the gold salt from different houses. It is seldom the same, except in this particular—that *it always contains another salt* in variable quantities. The variable quantity of the extraneous salt naturally is the main cause of the variable action in the toning. In some of the specimens of the chloride of gold I have found, in addition to common salt in abundance, a considerable quantity of chloride of silver. For toning purposes this addition of the silver chloride is, perhaps, no great detriment; but for electroplating it is the cause of constant failures. As I remark, it is no great detriment to the toning, because the moment you make a solution the chloride of silver remains undissolved and is filtered out, and is so much loss, thus detracting from the strength of the gold salt. Furthermore: it must not be imagined that this gold salt is simply a double salt of gold and sodium—a combination of single equivalents; on the contrary, it is an irregular mixture, and sometimes the chloride of sodium (common salt) is present in larger proportion than the terchloride of gold. Owing to this irregularity in the mixture (for it is really not a chemical combination), which is the cause of the irregularity in toning above alluded to, I am desirous, if I can, of suggesting some plan by means of which either stock-dealers can always be furnished with an invariable article, or photographers and consumers may manufacture the article in question easily and expeditiously themselves.

Let the stock-dealer, therefore, have the first chance. In the first place, the laity—that is, the consumers—must know that there is but very little profit made by the sale of pure nitrate of silver or of pure chloride of gold—nothing like the profit made by the sale of retouching-frames or some other fashionable appendage to the pile of photographic apparatus; hence we have to approach them with some degree of deference and humility when we entreat them, for honesty's sake, to abstain entirely from the sale of all spurious salts of gold, and to carry out a fixed determination of selling only the *pure* terchloride of gold in the liquid condition, in vials that shall be labelled according to their contents in metallic gold. For instance: supposing a drachm of gold is dissolved in nitro-hydrochloric acid, and the solution is evaporated to dryness with the proper precautions, and afterwards redissolved in ten drachms of distilled water, and finally bottled up in single drachm vials, it is evident that each vial will contain six grains of pure gold converted into the terchloride. This latter will be equivalent to nine grains and one-quarter in weight of the terchloride of gold without the water. Such a little vial will contain more available gold than the so-called fifteen-grain vials of chloride of gold now in the market, with few exceptions. The fifteen-grain vial of the double salt of chloride of sodium and gold (in chemical equivalents) would contain about eight grains of pure gold; but from actual analysis I have never got as much as eight grains, seldom more than six, and more frequently less than six.

Our readers will easily find from the record of these analyses the clue to their failures. Beseech the manufacturing chemists to manufacture only pure terchloride of gold; beseech the stock-dealers to sell you only a genuine article in definite proportions of the real article—that is, gold. But if all this beseeching is in vain, then, dear photographer, I will tell you what to do in order to be certain at all times as to the contents of your gold solutions—make the chloride of gold yourself.

To do this with ease and at a moment's notice you require a spirit-lamp, a small evaporating-dish of porcelain, a one-ounce vial containing nitric acid, and a two-ounce vial containing hydrochloric acid (each of the vials being furnished with one of Tweed's patent medicine droppers), and a few books of pure gold-leaf. The latter article is adulterated with silver in that variety called light gold-leaf; you must therefore get the best gold-leaf, such as is used for gilding on glass. Four of the leaves in one of these books are equivalent to about fifty square inches, and weigh one grain; or the whole book of twenty-four leaves weighs six grains. If, therefore, you wish simply to strengthen an old toning solution, take out four leaves of the gold and place them in the porcelain evaporating-dish, which you can easily hold in your hand. Now drop upon the gold six drops of hydrochloric acid and three drops of nitric acid. Immediately the gold will begin to disintegrate, and soon it will be entirely dissolved; if not, move the dish backwards and forwards over the flame, and add a drop or two more of either acid if this be necessary. Still moving the dish over the flame, evaporate the solution to dryness and until the residue *begins* to turn of a deep orange-red. Your salt is now made; dissolve it in a drachm of water, and add it to the toning solution.

The orange-coloured residue is a very deliquescent salt, and if it be left exposed to the atmosphere for an hour or two it attracts moisture, and very soon becomes a yellow solution, which turns blue litmus-paper red, but still it contains so little acid as to render it unnecessary to neutralise it. I have been in the habit of keeping on hand a bottle of filtered lime-water to neutralise the solution; but I find that this solution, as well as that of the alkalies or carbonated alkalies, has a tendency to decompose the solution of terchloride of gold, decolourising it, and precipitating gold either in the regular condition or in the form of some combination. This decomposition is very apt to take place on the application of heat. The practitioner must, consequently, be very careful not to heat the toning solution too high, otherwise he will find his gold mostly thrown down as a brick-coloured precipitate. Should this decomposition take place filter the solution through a small filter. The liquid portion, or the filtrate, still contains gold, and must be retained as your toning bath. As soon as you can remove the filter from the funnel place it in the porcelain evaporating dish, and drop upon the residue, on its surface, a few drops of hydrochloric acid, and afterwards half the quantity of nitric acid. In this way the residue is converted again into the chloride of gold, which is evaporated to dryness and afterwards washed out with water. A still better plan is to thoroughly dry the filter with its contents, then set fire to the filter on the dish and burn it to ashes. In this way you have no trouble with the paper, and the ashes are easily separated by filtration as soon as the residue has been converted into a solution of chloride of gold.

What to do with a very old toning bath, containing much alkali or alkaline earth, such as chloride of sodium, chloride of potassium, chloride of calcium, &c.:—

In such a case as this it is best to separate the gold entirely from the solution, either as metallic gold or as a compound of gold.

There are several ways of making this separation.

In the first place, if the bath contain any sediment filter the solution, and dissolve the residue in nitro-hydrochloric acid, aiding the operation by applying heat. Add this solution to the filtrate, and filter again and call the solution G.

To separate the gold or tersulphide of gold:—

Pass through the solution G a current of hydrosulphuric acid as long as a brownish-black precipitate is produced. This precipitate is the tersulphide of gold, which is collected on a filter, washed in several waters, and finally dried. If the residue is in large quantity scrape it from the paper and place it in the evaporatfng dish, burn the paper over the dish, and add the ashes to the residue, and now apply heat to the dish until all, or nearly all, the sulphur is expelled. If the residue is in small quantity it is burned with the filter, and the ashes are dropped into a dish.

The next part of the process is to convert the residue and ashes into the terchloride of gold. Drop upon them a sufficient quantity of hydrochloric acid and of nitric acid; apply the flame, and dissolve; finally, evaporate to dryness, dissolve in water, and filter. The solution is pure terchloride of gold.

To separate the gold as metallic gold:—

To the solution G throw in a lump of zinc, and add sulphuric acid. Hydrogen gas is produced, and metallic gold separates as an ink-coloured film and a black ink-coloured precipitate. Filter, and wash the residue well. This is pure gold powder, from which the terchloride is prepared as before directed.

N.B.—It would be a great advantage if gold could be purchased in the state just mentioned; for, being finely divided, it is easily dissolved, and might be sold cheaper than gold leaf.

A similar separation of the gold from G can be effected by boiling the solution with oxalate of ammonia, and then filtering. The colour of the precipitate is, as before, ink black.

Finally: I begin to think that the addition of acetate of soda, chalk, lime, chloride of calcium, chloride of lime, soda, carbonate of soda, &c., &c., in general, is not only unnecessary, but in many instances injurious—unnecessary, if the terchloride can be obtained nearly neutral at the beginning, of itself; and injurious, because they institute decomposition. I am am not fixed in this opinion, because I do not yet thoroughly understand the necessary conditions. It may be that an incipient decomposition is necessary, so that very little electric energy in the silver picture is required to produce the requisite separation of the gold, and to attract it to the picture. If this be the case then a few drops of lime water will be excellent, and it remains to be found out how much must be added, and the limits beyond which we may not go. AN AMATEUR.

—*Mosaics.*

SCIENTIFIC JOTTINGS.

PYROGALLIC acid has been the subject of some experiments lately by O. Loew, who wished to ascertain more thoroughly the results of its oxygenation. In the course of photographic development, by the joint action of the air and the silver salts, we have a familiar example of its appearance when oxygenated; but Herr Loew simply exposed it to an atmosphere of oxygen in an apparatus which enabled him to agitate it thoroughly. The result after half-an-hour was a considerable evolution of carbonic acid, the production of small quantities of two crystalline acids, and of a salt termed pyrogallo-quinine. He notes that concentrated aqueous solutions of pyrogallic have a very strong absorbtive action upon many gases.

We made some remarks in a leading article a little while ago upon the action of the products of gas combustion upon photographs when exposed to their influence. A very remarkable confirmation of the desirableness of attention being called to the noxious effects of these gaseous emanations has recently been afforded. The librarian of one of the public libraries forwarded to Professor Church the backs of several volumes which had been "shed" by the books on the upper shelves of an apartment illuminated by gas. The leather was carefully removed by scraping, avoiding the touching of the paper beneath, as it might contain size; this, he states, was easy enough, as the leather resembled Scotch snuff in its consistency. An aqueous extract was made of this leather, and the enormous amount of 6·21 per cent. of sulphuric acid and 2·21 per cent. of combined acid was found to be present. If a strong, well-tanned hide can give way like this can it be wondered at if a simple photograph when unprotected should give way also? Upon examination the following interesting facts were noticed:—Vellum stood the vapours perfectly; morocco suffered least among the leathers; calf was much injured; and Russia most of all. Naturally enough, it was found that the higher the shelves the greater the disintegrating action that had taken place.

Messrs. W. J. Russell and N. S. Maskelyne have been conducting some interesting experiments with double salts of silver with the alkaline nitrates, &c. The following are a few of the results obtained:—If mixed in equivalent proportions the nitrate of potash crystallises out, but fails to do so if the proportion of silver nitrate be increased to and beyond a certain limit (which they determined), a true double salt containing an equivalent of each salt being the result. With nitrate of soda they failed to obtain a double salt; and a strange anomaly was experienced—the silver nitrate, though it is the more soluble by far of the two, began to crystallise out the first. With nitrate of ammonia a double salt, similar to the potash, was obtained; but with lead and with lithia none was formed. The preferential crystallisation of one or other salt from solutions of two salts was found to depend upon their hygroscopic tendency rather than their relative solubility.

Our Editorial Table.

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YORK'S CATALOGUE OF PHOTOGRAPHIC MAGIC LANTERN SLIDES.

SUCH is the exceeding comprehensiveness of the new catalogue of transparencies for the lantern just issued by Mr. Frederick York, of Notting-hill, that it is almost impossible to indicate a class of subject that has been overlooked. Three pages are devoted exclusively to an index to the various classifications, and when we state that one entry in the index represents in some instances several hundred pictures, the nature of each of which is detailed in the volume, some idea of this comprehensiveness may be formed. Of modern, as distinguished from *ancient*, London alone there are over seven hundred and forty different pictures catalogued. We need scarcely remind our readers that Mr. York is not a mere dealer in such pictures; for, on the contrary, he is an experienced and hard-working practical photographer, a great number of the views and other pictures here enumerated owing their existence to his own actively-employed camera and individual skill.

The catalogue reveals the fact that much is now being done in the way of issuing slides in sets or groups, each set illustrating a definite theme, story, or scene. Some of these groups belong to fairy lore and grotesque tales, others illustrate popular pieces of descriptive poetry; here we find a series devoted to scenes described in Holy Writ, there we observe a set of illustrations to the adventures of Don Quixote. While many are simply amusing others are strictly instructive; and we cannot conceive of a more pleasant mode of receiving instruction than by the means of a carefully-prepared popular lecture, interspersed with attractive photographic illustrations exhibited as dissolving views. Mr. York is a most enterprising caterer for the public taste, for he has secured the right to reproduce, in the form of slides, the various engravings now appearing in the *Illustrated London News* and *Graphic* illustrative of the events of the war at present raging in Turkey. The sharpness and clearness of Mr. York's slides are everywhere recognised by photographers.

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DUBLIN UNIVERSITY MAGAZINE.

London: HURST AND BLACKETT.

MESSRS. ELLIOTT AND FRY furnish the photograph with which the present number is illustrated, the printing being done, as usual, by the Woodbury mechanical process. The portrait in this month's number is that of Mr. John Linnell, Sen., one of our greatest landscape painters. From the biographical sketch accompanying the portrait we learn that Mr. Linnell is upwards of eighty-five years of age, that he was admitted a student at the Royal Academy in 1805, and that at the early age of fifteen he was an exhibitor there and obtained the prize of a silver medal for a drawing in the Life School. He won other prizes, and such was his versatility as an artist that one of them, in the form of an Academy medal, was given for sculpture. His main subsistence in early life was derived from miniature painting—a class of work to which photography, as stated by Linnell himself, is so deadly a foe. His admirable biographical sketch concludes as follows:—

> "Our photograph of the old painter was taken several years ago; several new photographs were taken, but none satisfied their subject and the managers of the *Magazine* alike. Dressed in a close grey suit with the chosen one of a score of broadbrim hats shading his brows, Linnell sits at clear, easy distance from his easel, holds his brush at arm's length, and takes a view over his left hand as a mariner by a point out at sea. Then with a short, sharp, nervous, incisive movement of hand and brush, he lays down his living mark of colour. Though that hand may not be so strong as it was sixty or seventy years ago, it shows no diminution of vital energy, or of the cunning that it has so long possessed."

Among the other matter is an excellent article by Dr. Keningale Cooke, on what is unfortunately a seasonable subject, viz., *The Logic of the Methods of War;* but that which will prove of most general interest is the able and somewhat lengthy article on the *Journalism and Poetry of Mortimer Collins.*

We learn that a change in the title of this old magazine is contemplated, the word "Dublin" being about to be omitted.

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HANDY ENCYCLOPÆDIA FOR THE WORKSHOP.

London: OFFEN AND Co., 3, York-street, Covent Garden, W.C.

THIS is indeed a most useful and handy serial, which is being published in penny weekly numbers, four of which have been already issued. It is replete with items of information calculated to prove of great value to the mechanic and amateur, to whom we strongly commend it.

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CHRISTMAS CARDS.

By Mr. and Mrs. S. G. PAYNE, Aylesbury.

THIS attempt to press photography into the service of Christmas is both happily conceived and highly successful. These Christmas cards are of two kinds. In one we have represented such hampers of fish, game, &c., as are associated with those kindly feelings cherished at the "merrie Chrismastide;" in the other we have Flora's choicest treasures arranged in a most artistic manner, with seasonable printed mottoes attached. These latter pictures are effectively coloured. Christmas cards of this kind will be certain to meet with much favour at the hands of the public.

Meetings of Societies.

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MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
Dec. 3	West Riding of Yorkshire	Commercial Hotel, Bradford.
,, 5	Edinburgh	The Hall, 5, St. Andrew-square.
,, 5	Bristol Amateur	Museum, Queen's-road.
,, 6	South London (Ann. Meet.)	Society of Arts, John-st., Adelphi.
,, 6	Photographer's Benevolent Asso.	Offices, 160A, Aldersgate-st., E.C.

BERLIN PHOTOGRAPHIC SOCIETY.

A MEETING of this Society was held on the 5th October, the President, Dr. Vogel, occupying the chair.

The proceedings were commenced by the President communicating to the meeting the news of Mr. Fox Talbot's death, upon which the meeting testified its respect for the memory of the deceased by rising *en masse.*

Herr REISING then made a communication respecting his process, which he believed to be identical with the negative printing process as employed in the State Printing Establishment. A glass negative was prepared, so that it might be rolled with ink like a lichtdruck plate, and printed from in a lithographic or copperplate printing press. The process was suited for black and white, but not for half-tones. He exhibited a blackened negative upon thick plate glass, from one quarter of which the black had been removed in order to show the original condition. The latter differed but little in appearance, whether one looked upon it or through it, from an ordinary negative. This process is easily adapted to other printing processes. For instance, he (Herr Reising) had taken an impression upon stone, thus producing a lithographic printing plate which left nothing to be desired, as shown by a proof exhibited. Then, by taking an impression from the negative in fatty ink upon zinc, and etching the zinc plates, printing plates in relief, printable by a letterpress printing-press, were obtained. He (Herr Reising) showed an impression from such a zinc plate, which was remarkable for the depth of the etching. Transfers could also be made to wood, upon which a drawing was thus placed ready for the engraver to cut out. The principal recommendation of the process was that neither collodion, gelatine, nor any other vehicle was requisite.

The remarks of Herr Reising were listened to with the greatest attention and interest, and when they were concluded,

Herr PRÜMM said that though being the same as that employed in the State Printing Establishment Herr Reising's process could not be considered new, still as the former was quite a secret, the latter was, to all intents and purposes, new to the audience. He then inquired the probable cost of prints.

Herr Reising could not say exactly, but they would be very cheap indeed.

Dr. Weissenborn exhibited a number of burnt-in enamels, &c., and then proceeded to read a paper communicated by Herr Stender, of Lamspringe, upon photo-enamels, pyro-photographs, &c. In the introduction to the details of his processes,

Herr STENDER said that there was still a great outcry as to depression of business in photography. He remembered that, about a year ago, Dr. Weissenborn threw out some suggestions as to various means of reviving trade by the introduction of novelties, such as photographic transparencies with matt ornamental borders. That idea, he thought, very good, as transparent pictures formed very tasteful window decorations; but, he went on to say:—"Why in the world make these transparencies by the collodion, carbon, and similar processes, when they could be produced as easily, and of equal beauty, by pyro-photography, and, if necessary, quite as cheaply in insoluble enamel colours, while photographic transfer pictures (carbon prints not excepted) only last a comparatively short time? Indeed, with every care the latter soon become affected by the sun, by damp, and by changes of temperature; and even the precaution of covering the picture side with a sheet of glass is illusive, and, indeed, as shown by experience, only accelerates matters. And when one goes on to read in the trade journals how to replace the etched-glass ornamental frames—which are, to my astonishment, supplied from France—by sheets of gelatine and 'Paus' paper, the thought occurs to me involuntarily that '*messieurs*' the photographers are doing their very best to bring their productions into discredit with the public on account of their fugitiveness. And now, gentlemen, I shall tell you how I think solid, beautiful, durable window pictures that would be worth the money should be prepared :—Make your transparencies by pyro-photography in vitreous, acid resisting colours, and then upon the *same sheet of glass as the picture* have your border ornamentation in photographic glass etching, and throwing on one side all the rubbish of Paus paper, gelatine leaves, cardboard, or leather cases and protecting glass, offer these pictures to the public in simple but tasteful metal frames, and the public will not be slow to recognise that you offer them in substantial goods the worth of their money. Then, instead of the ordinary window glass, if you use Siemens' pressure-hardened plate glass, the risk of breakage through transport, falls, or knocks will be reduced to a minimum, as this glass has about ten times the resisting power of ordinary glass." He (Herr Stender) then went on to recommend the printing of vitreous enamels upon porcelain as even more likely to pay than the foregoing. Then, after asking how it came that so few eminent photographers had devoted themselves to that branch, he answered himself by saying it was partly because enamelling could not be learnt from books, and partly because of the misapplication of the word "enamel" to pictures that were merely glazed, as if the gloss were the peculiarity of enamels. After this theoretical introduction he (Herr Stender) proceeds to give a detailed account of four processes which he designates, respectively, as 1. "Photo-emaillography." 2. "Pyro-photography," or burnt-in transparent photographs. 3. "Photographic etching upon glass." 4. "Photo-chrysography."

The President then gave a long account of a visit to the exhibition at Nürnberg, and showed some specimens of the much-talked-of Albert process in colours. He also presented a copy of the catalogue of the Nürnberg exhibition, which is of itself a work of art, containing, as it does, so many specimens of prints by photographic, lithographic, Woodburytype, lichtdruck, metal, and wood-cut processes. In conclusion, he (the President) mentioned that Herr Busse, of Berlin, Dr. Seelhorst, of Nürnberg, and Herr Obernetter, of Munich, had acted as photographic jurors at the exhibition.

Baron Von Stillfried brought the meeting to an end by exhibiting a number of Japanese landscapes and *genre* studies, the foundation of which consisted of photographs highly finished in water-colour, and by giving a humorous sketch of the photographer's life in Japan.

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Correspondence.

REDUCING SILVER.

To the Editors.

Gentlemen,—With reference to your article of November 23, on the paper I read before the Manchester Photographic Society on the reduction of silver bromide, I beg to say that it is not *my* process. It is to be found in any elementary work on chemistry, under the glucoses or saccharoses, and is, I believe (according to Fownes), used by surgeons to determine the disease called "diabetes." I may say that I am indebted to a friend for the application of the process.

I take exception to the method of reducing silver nitrate dipping-*baths* to the carbonate. Old baths, usually, are *saturated* with silver iodide, purposely added when the bath is first made up, afterwards dissolved out of the collodion during the dipping of the plates, and held in solution by the silver nitrate. Now silver iodide, not being converted into silver carbonate by addition of soluble carbonates, nor into nitrate by addition of nitric acid, is consequently redissolved on adding nitric acid to the silver carbonate in the subsequent process of forming silver nitrate; therefore, the salt so formed is not pure.

I imagine experimentalists with bromide emulsions would discard such an addition to silver nitrate.—I am, yours, &c., John W. Leigh.

Holly House, Northenden, November 26, 1877.

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AUXILIARY EXPOSURES.

To the Editors.

Gentlemen,—To live and grow fat on the gullibility of Englishmen seems to be the delight of foreigners. The quantity of puffs, patents, and secret processes that have been offered to photographers during the last few years easily demonstrates the truth of this statement. The last big thing is Signor Scotellari's cap. I am rather like your correspondent "Sold," though my softness dates back to the Winstanley secret method. Having had a visit from the Signor and his interpreter, a fair statement of matters may interest your readers.

Two double plates were exposed. The result was decidedly in favour of that portion of the plate exposed without the auxiliary business. But what I have most to complain of is that when the Signor and his friend saw the result was not to their credit, they wanted me to go to the Chevalier's studio, and have a bet of £40 on the result. My answer was :—"I want it done *here*, for it is here I have to work."

My next complaint is that when my assistant was developing the plate the interpreter requested him to "keep the developer on *this end*," and also asked him to intensify it and pour the intensifier on "this picture," the said picture being that end of the plate conjured by them.

When I purchased the Winstanley process I was solely influenced by the puffing character of the letters of photographers whose names are great in the profession, but, I am sorry to say, whose influence has had much to do with extracting the coin from our pockets without our receiving fair value for it.—I am, yours, &c., W. Currey.

7, *Market-street, Manchester, November* 27, 1877.

[Having so recently published Signor Lombardi's letter in favour of the particular method of giving auxiliary exposures, now being sold by Sig. Scotellari, we have the less hesitation in publishing one on the other side. Our own opinion is, and it is founded upon experiment, that under certain circumstances an advantage is gained by auxiliary exposures, whether the exposure be given by means of an aperture covered with paper in the camera, by exposure to coloured light or very weak white light, to a candle flame or a gas flame, to light transmitted through a piece of opal glass in the cap, or through coloured paper in the cap (Scotellari's method). We are of opinion that if Mr. Currey will try some of the numerous methods we published several years ago, and upon the use of which there is no restriction, he will endorse the opinion we have just expressed.—Eds.]

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Photography in Court: A Curious Action.—At the Bloomsbury County Court, on Tuesday last, the case of Evans *v.* Wright was heard before Mr. Judge Russell and a jury. The plaintiff, a photographer, sued the defendant, a gentleman residing at Halesowen, in Shropshire, to recover the sum of ten guineas for work and labour done on an account stated. The solicitor for the plaintiff said that his client was instructed to take a series of photographs of the defendant's family and friends when at their town residence in Portland-place on the occasion of some private theatrical entertainment being given at the defendant's house. The photographs were to be taken in character, and were to be ready for presentation to the assembled guests on the evening on which the representation was to be given, which was in October of last year. The plaintiff had obeyed the instructions given, sent in the photographs, together with his account, which had not been paid, and hence the present action. This statement was corroborated by the plaintiff. The defendant said he did not repudiate the order given, but the plaintiff had made a most absurd mistake, and had photographed all his friends in a group instead of separately, as he intended; and as the plaintiff had charged so much he did not feel justified in paying it. The plaintiff said the order was a written one, and produced it in court. As nothing was said about separate likenesses the order was evidently for a group. He attended at the defendant's residence with his operator, and took seven portraits together in character, which were delivered as requested. The Judge ruled that as the defendant had given so vague an order he ought to be held responsible for it, and therefore gave judgment in favour of the plaintiff, with costs.

Krüger's Argentometer.—Herr Krüger, of Berlin, has (says the *Mittheilungen*) patented an instrument for determining the silver contents of a negative or positive bath, or other silver solution. The instrument consists of a balance, the indicator of which is a tongue hanging down in the middle. At the end of one arm of the balance a movable strip of copper is hung on; the other ends in a screw, upon which different weights are screwed to bring the beam to a level. To use the instrument, the equipoise of the balance is first obtained. A small but known quantity of the silver-containing fluid to be tested is then poured into a test tube, diluted with a little water, and acidified with nitric acid. The strip of copper hanging from one end of the beam must now be unhooked and placed in the test tube, when the silver contained in the solution will be deposited in small particles on the copper. With a moderate temperature this reaction should be concluded in about ten minutes, though if the fluid be not acidified it lasts somewhat longer. To ascertain whether or not it has ended another piece of copper may be inserted into the test tube, and, if the slightest trace of silver be precipitated upon it, then the reaction has not terminated. In place of the silver deposited a corresponding quantity of copper has dissolved, and thus the strip of copper has become lighter. It is upon this last fact that the principle of the instrument is based. The strip of copper is removed from the test tube and dried, the deposit of silver having been previously washed off, and re-hooked on to the end of the beam, which is no longer level. The indicator inclines to one side, and by placing a scale under it one sees how many decigrammes of silver have been precipitated by the copper, or, in other words, how much silver was contained in the fluid; and, as the quantity of the solution diluted was known, it follows that the percentage of silver can easily be reckoned, and from that the percentage of the silver salt used. [See report of the meeting of the Berlin Photographic Society held September 21, page 537.]

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EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale*, that being done at a small cost in our advertising pages. This portion of our columns is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

A large lot of surplus stock will be exchanged. List forwarded.—Addeess, H. BROWNING, 33, Piccadilly, Hanley, Staffordshire.

I will exchange a quantity of lantern slides and oil colours for photographic chemicals, apparatus, or anything useful.—Address, J., 55, Geraint-street, Liverpool.

Wanted, a *carte* or cabinct burnisher; also a Malden dissolver and lantern slides, in exchange for studio camera stand, repeating back camera, head-rest, *carte* rolling press, embossing press, and water-tight glass baths in mahogany case.—Address, E. J. CHESTERMAN, 12, Chipping House-road, Sheffield.

Wanted, Dallmeyer's 1B or similar *carte* lens, in exchange for Ross's No. 1 portrait lens and an excellent 12 × 10 camera, or good double-barrelled gun. Also wanted, dipping bath, size about 14 × 11, and interior background for other articles.—Address, JAMES MARTIN, Photographer, Insch, Aberdeenshire.

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ANSWERS TO CORRESPONDENTS.

PHOTOGRAPHS REGISTERED—

W. Gillard, Gloucester.—*Portrait of "Toddie."*

Thomas Johnson, Leicester.—*Two Portraits of the late Robert Warner.*

Jas. Cooper, Darlington.—*Two Views of Market Tower and High Row, Darlington, and Two Interior Views of St. Cuthbert's Church, Darlington.*

☞ *Correspondents should never write on both sides of the paper.*

NOTICE.—Each correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a *nom de plume* as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications

AMATEUR.—There will not be any loss of sharpness by printing through the collodion film.

SEMPER FIDELIS.—The address required is 8, Great Turnstile, Holborn, London, W.C.

W. H. BROWNING.—The annual subscription to this Journal in this country is fifteen shillings and two pence per annum, post free.

C. W. (Antwerp).—The annual subscription, including postage to Antwerp, of this Journal is 17s. 4d.; Almanac and postage, 1s. 6d.

AN OLD PROFESSIONAL.—Arrange the group in a slight curve, and then take them with a portrait lens having a working aperture of $\frac{f}{4}$.

JAMES HUNTER.—It is probable that the forthcoming ALMANAC will contain one or more articles on the special subject concerning which you make inquiry.

E. B.—The composition and the general idea are unexceptionable, but we are quite unable to congratulate you upon the manner in which these have been carried out.

T. W. KIRBY.—Thanks. The sample of gutta-percha received appears to be very pure indeed. We shall dissolve it as indicated, and try its effect as a substratum for dry plates.

ENQUIRER.—The simplest way by which to produce enlargements upon opal glass is to print upon carbon tissue from an enlarged negative. and develope it upon the plate of opal as the permanent support.

B. S. W.—The portraits are all fancy sketches. Did you expect for a moment that a series of "Old Testament worthies" were taken from *photographs?* If so, by what means, think you, were they photographed?

M. C.—There are no photographic journals in France which correspond precisely to those issued in this country. The *Bulletin de la Société Francaise* or the *Moniteur* will answer your purpose; the latter will probably suit best.

M.A. (Oxon).—There are several causes by which the formation of the metallic silver stains may be accounted for. Unless you give a detailed description of your method of operating and the chemicals employed we shall be unable to render you any assistance.

JOHN LOCKETT.—We are preparing an account of the Beechey-Abraham lantern for publication, which, we expect, will appear in our next. After that we shall be glad to be furnished with the details of such improvements as you may have effected upon this form of lantern.

GEO. BROWN.—There is not in existence such a society as the one you describe, nor in the very nature of things is such a society possible.

"AUSTRALIAN."—Send to any friend or acquaintance in this country two letters—one intended for the person himself authorising him to receive, and the other addressed to the defaulter requesting him to pay, as per instructions. It will also be better to accompany these letters with a photographic or other copy of the acknowledgment to which you refer as being in your possession.

J. W. WALMSLEY puts two questions, which we publish in the hope of getting a reply from some of our readers. The former of the two will, we suspect, remain unanswered, from the fact that Ferrier used albumen, while our correspondent employs collodion. He says—"First: what is used in the toning of transparencies so as to get a colour like the Ferrier slides? I use the wet process—that is, the varnished negative placed on the top of a collodion wet plate. Second: what is the most suitable kind of wood for making dippers?"

W. LUMLEY (Melbourne).—Had you been residing in Europe we should have advised you to obtain *practical* lessons in the art of producing phototypes and photolithographs, which, on payment of a moderate fee—say fifty pounds—you could obtain from several competent persons or firms. Under existing circumstances we can only advise you to master the principles of these processes by reading, and then commence a course of experimenting with them, adhering to one process at a time until it is thoroughly mastered. We cannot accede to your request to impart special instructions. The felt through which gelatine is filtered is of an open, spongy texture. Broad masses of white in the block must be deepened by mechanical means.

"GELATINE" asks:—"Will Mr. Kennett stretch out a helping hand to gelatine emulsion workers, and describe to them the best way of washing out the useless salts? In my own practice I break up the gelatine into as small particles as possible, and soak them in water. By this method the useless salts are quickly soaked out; but, unfortunately, there is a drawback to this otherwise useful method, and that is the difficulty there is in ridding the emulsion of the water previous to dissolving it to coat the plates."

W. M. PHILLIPS (Brighton).—Our correspondent desires information on a subject of general interest, about which he writes as follows:—"I wish to obtain advice how to prepare a sensitive paper that will keep for at least two months. I have tried several formulæ I have seen in your ALMANAC, and also one of Dr. Richardson's formulæ. The paper printed all right, but it refused to tone, and when put into the soda it blistered very badly. Now the way I prepared my paper was this:—Silver, fifty grains to the ounce, floated two minutes, then removed from that bath to one containing silver, one ounce; nitrate of ammonia, one ounce; loaf sugar, thirty-two grains; citric acid, a hundred and sixty grains; C. P. nitric acid, half-a-drop; water, sixteen ounces. Now I tried all I could think of to get rid of the blisters. I tried strong brine after fixing; I also tried alum in the water before using the soda, then again in the soda, but to no avail. Now, could I through the Journal obtain some good formula or mode of working this durable sensitive paper it would be bestowing a great favour on an earnest worker of sensitive paper."——Can any reader give the desired information?

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SOUTH LONDON PHOTOGRAPHIC SOCIETY.—The annual meeting of this Society for the election of officers and other matters of business will take place on Thursday next, December 6th, in the Rooms of the Society of Arts, Adelphi.

SERIOUS ACCIDENT.—We learn with much regret that our able correspondent, Mr. Henry Cooper, has met with a serious accident when out riding near his residence at Torquay. His horse, a fine, powerful mare of 16 hands, reared with him, and losing her balance fell backwards upon Mr. Cooper. Although no bones were broken his right leg has been fearfully crushed, and it will, we fear, be a long time ere Mr. Cooper is enabled to be out again. In the meantime he may be assured of the warm sympathies and kindliest wishes not only of ourselves but of everyone who reads this paragraph.

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METEOROLOGICAL REPORT.

Observations taken at 406, Strand, by J. H. STEWARD, Optician

For the Week ending November 28, 1877.

THESE OBSERVATIONS ARE TAKEN AT 8.30 A.M.

Nov.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks
22	29·24	W	46	49	54	38	Cloudy
23	29.56	W	41	45	50	43	Hazy
24	29·50	E	40	41	54	38	Foggy
26	29·98	W	37	39	51	34	Foggy
27	29·34	W	49	51	53	38	Cloudy
28	29·30	W	40	42	—	38	Cloudy

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 918. Vol. XXIV.—DECEMBER 7, 1877.

APPLIANCES FOR VOLUMETRIC ANALYSIS.

There are many calculations in connection with photography which render necessary the determination to a degree of some nicety the exact quantity of some particular substance in a small quantity of a given liquid; or it may be that the purity of one of the numerous salts employed is suspected, and in order to arrive at a satisfactory conclusion on the point it is necessary to resort to volumetric analysis. But how many photographers are in possession of even the crudest appliances for performing such an operation? We frequently hear the recommendation to test the strength of the bath by volumetric analysis in preference to employing the argentometer; and we venture to say that, in nine cases out of ten, where that recommendation is adopted the operation is performed in such a manner and with such appliances as to render the accuracy of the result, to say the least, problematical.

As a matter of fact, we not long ago met with an instance in point. An amateur having got into trouble with his printing bath put it through a course of "doctoring," and before again taking it into use was desirous of ascertaining its strength. The argentometer was out of the question, as it contained originally, in addition to the silver, both nitrate of soda and sugar, to say nothing of the fresh salts introduced in the ordinary course of working. Accordingly he proceeded to test it by the volumetric method, with the somewhat surprising result that, though it had sensitised many sheets of paper, it was three or four grains richer in silver in each ounce than when freshly made, and that without a proportionate decrease in bulk, which would account for it on the score of evaporation. It proved that our friend had proceeded in the first place to make a solution of chloride of sodium of so many grains to the ounce, had tested a measured quantity of the bath by dropping into it, by means of a pipette, the necessary quantity of chloride to precipitate the whole of the silver, and had then calculated that so many *minims* of solution used, containing such a quantity of salt, represented so many grains of silver nitrate.

Theoretically there is, of course, no fault to be found with such a course, but it is the mode in which it is put in practice which is to blame. First, as regards the volumetric solution: it will be found in practice that the ordinary one- and two-ounce graduated measures are wholly unreliable for such purposes, as the graduation is frequently most carelessly performed. Of three or four in our possession at the present time no two agree perfectly at the one-ounce mark. We may add to this the extreme difficulty, if not impossibility, of reading off the measurements with sufficient accuracy for even an approximation to truth. But the gravest error in the case we speak of is the acceptance of the *drops* delivered by the pipette as *minims*. We have never yet been able either to make or obtain a pipette which would give a correct result in such a calculation unless it were first ascertained how many of the drops delivered by it go to make a drachm. If such a knowledge be obtained, the quantity of solution actually used may be calculated with more success; but the size of the drops will vary with the solution employed. In practice it will be found that the majority of such tubes deliver drops measuring less than a minim.

At a cost of a few shillings may be obtained a properly-graduated *burette* or alkalimeter; but, as the occasions on which such instruments are required are comparatively few and far between with most photographers, we do not counsel an investment which many would hesitate to make. In lieu thereof we propose describing how an efficient substitute may be made at an outlay of a few pence. Though possibly the strictest accuracy will not be obtainable in all cases, the instrument will be found fully equal to the task of testing the negative or printing bath; while, if carefully made and used, it may be applied to such delicate operations as the determination of the excess of silver or bromide in emulsions, or the calculation of the combining equivalents of those salts.

In the first place, procure a piece of hard glass tubing of about half-an-inch internal bore. The length will depend upon the number of grains' capacity it is intended to be; if one thousand, it will require to be about eighteen inches. A tube of this length and bore may be obtained for twopence or threepence. Next we have to decide upon what form of *burette* to adopt. The best and most convenient, as well as the easiest in construction, is that known as Mohr's, which consists of a tube of the dimensions given above, one end of which is drawn out narrower, connected by means of a short piece of india-rubber tubing with a thinner tube drawn to a fine point. A spring clip is fixed upon the rubber tube, midway between the two glass ones, so as to pinch it and prevent the passage of any liquid until the pressure is taken off by loosening the clip. The instrument is suspended, in a perpendicular position, in such a manner that the vessel containing the solution to be tested may be placed beneath it to receive its contents, which are delivered in small quantities at a time by releasing the clip.

The instrument we have in use is a slight modification of the above, though identical in principle, and we will describe its construction. We may premise that those of our readers who desire to make one of these instruments, but are not sufficiently practised in glass working to venture upon it, may get the tubes drawn or closed by a glass-blower or maker of chemical apparatus for a few pence, reserving the graduation and finishing of the article as their own share of the work.

Having procured a piece of tube of the proper dimensions, proceed, with the aid of a Bunsen's burner, to soften and draw out one end to a point, like a dropping-tube. Let the taper of this point be as obtuse as it can be made compatibly with symmetry and efficiency in dropping. The opposite end of the tube is raised to a red heat to make the edge smooth and regular and to strengthen it. The open end is then fitted with a good, sound cork, through which is passed a piece of thin glass tube the thickness of a quill, upon which to fix the rubber tube and clip. In our own instrument the quill tube is bent in the form of a siphon or ∩, so that the india-rubber tube and clip, when attached, hang parallel with the main tube, and are thus brought more easily within reach of the operator. All that now remains is to graduate the instrument.

Another form, not quite so convenient in some respects, is made as follows:—Instead of drawing the tube to a point, one end is closed altogether; the other end is heated until quite soft, then, with a piece of stout iron wire previously heated, press gently round the interior edge of the orifice, so as to widen it slightly. This done press the iron firmly but gently against one side, when the edge will be drawn over, and form a lip from which to drop the contents of the tube. When cold it is ready for graduation.

This operation, though requiring care, presents no difficulty; the object to be attained is to divide the tube into one hundred equal parts, or, more correctly speaking, to mark off one hundred equal degrees, not necessarily filling the whole of the tube. This is done by weighing into the tube successive quantities of some liquid to form the principal divisions or tenths, and these may be subdivided by means of dividing compasses for the one-hundredths. We proceed, then, to suspend the tube by means of a loop of twine or thin wire to one arm of an accurate balance, the scale pan being removed; take care that it hangs properly, for if a knot in the twine or a bend in the wire throw it out of position inacuracy will result. Before counterpoising the tube we must fix what we may term the "zero"—that is, the point at which the scale is to commence; this is necessary on account of the irregular shape of the extreme lower end of the tube. In the first one described the zero point may be fixed very slightly above the commencement of the taper, and a mark made with a fine file. In the other form it is fixed in the following manner:—Fill the tube with water; pour out the water and hold the tube, orifice downwards, for five or ten seconds, to allow it to drain; then reverse it and allow it to remain in a perpendicular position for a minute or two. It will then be seen that the water retained on the interior surface of the tube has accumulated to a depth of a quarter or perhaps three-eighths of an inch, at which point make a mark with the file.

Drop into the tube sufficient water to reach zero, suspend it to the balance, and counterpoise carefully. Now, supposing the tube to contain one thousand grain measures, place on the opposite pan of the scale one hundred grains, and balance it by adding the same weight of water to the tube, marking the point to which it reaches by a slight *touch* of the file; then proceed with the second hundred, and so on till the thousand is reached. With a pair of compasses try each of the spaces, and if they be all equal let the file marks be put in distinctly about a quarter of an inch long. The subdivisions are made by setting off on a piece of paper one of the spaces of a hundred grain measures, which is accurately divided by means of the dividing compasses into tenths. With this as a guide each of the spaces on the tubes is now marked off into degrees, the mark made by the file being in this case little more than a touch, in order that the principal divisions may be readily distinguishable. The fifth division in each space may be made a little more prominent.

The instrument is now complete, and if the directions have been followed carefully it is capable of working to the one-tenth of a grain without difficulty. We have found it useful in determining the combining equivalents of samples of the bromides of cadmium and zinc, for which purpose it is well adapted. The second form described also supplies a ready means of taking the specific gravities of ether and alcohol, or any liquids it may be desired to test. We may conclude by saying that the two instruments we have now in use have cost us together less than one shilling. We shall have a few words to say upon the subject of test solutions in another article.

CARBON PRINTING IN WINTER.

We recently alluded to the necessity for taking special precaution, during the winter months, to keep the solution in the dark room at an increased strength to produce effects equal to summer work; and we have lately, in experimenting with various tissues for carbon work, found such remarkable variations in our results that we think it by no means an unnecessary task to call our readers' attention to the great need existing for strict attention to atmospheric conditions in this increasingly-important branch of photography.

The experience of old practitioners with (say) albumenised paper is usually so engrained that it is most difficult to uproot some of it to prove that the treatment suitable for such paper is not by any means so for the preparation and storage of unsensitised autotype tissue, nor, indeed, of sensitised either. A ream of the former, just as receive from the albumeniser, is commonly put on the shelf and used just as it comes, and no alteration is found necessary in the manner of storage, whether in winter or summer. And so, again, is it with the floating bath: a few more grains of silver per ounce added to the bath will strengthen it quite sufficient for all purposes; and even if the strengthening were not carried out the results would not be so much defective as slow. But in carbon it is entirely different; a little more heat or a little more moisture will often make all the difference in the world between success and failure in some portions of the process.

We cannot do better than describe a recent experience of which we were cognisant to show the effect of climatic influences on the working properties of the tissue. We were present when some enlarged heads were being printed upon rough paper, when on each of them appeared something looking very like a black cap—a dense insoluble state of the tissue being locally present in each case. For some time we were all at a loss to comprehend the cause of this phenomena; and it was puzzling, seeing that a fresh piece of tissue behaved in a similar manner. The next step was to examine the tissue, when we found that a slight dusty black mark on the back of the tissue showed itself in a place corresponding with the insoluble portion in the finished print.

It was not at all probable that the dust had anything to do with the insolubility, and its cause had to be sought for elsewhere. Further consideration and experiment showed pretty conclusively that the cause of the peculiarity of behaviour was the action of the atmosphere upon the unsensitised tissue. We have for some little time now had much damp weather, and the rolls then being used lay in a cupboard without any further protection from the atmosphere, with the natural effect, owing to their hygrometric qualities, of a considerable amount of water being absorbed from the atmosphere. But, here is the point: it will be seen that the tissue being tightly rolled up the atmosphere could not freely pass between its folds, and the result would be that the outer layer of all would be quite damp, while the inner one, not being exposed, would remain fairly dry and crisp.

We entertain no doubt that this little experience will be the key to unlock a good number of hitherto unaccountable failures. That it was owing to this cause and not to the tissue being bad—as some of our correspondents are so ready to suggest whenever they are at a loss to explain a failure—was shown by a piece of plain tissue which was quite soluble, while the sensitised tissue at the spot indicated by the soiled back almost entirely refused to dissolve, and a narrow ribbon of it, after a slight exposure to light, developed a most marked black band in the same place.

We thus learn the important lesson that when tissue is in a soft, limp state when placed to sensitise it will, when ready for use, develope much more insolubly. It is well known to carbon printers that as the sensitised tissue ages it gets more and more insoluble, and at the same time prints more rapidly, while, as we were the first to point out, greater softness and delicacy accompany the long keeping of the sensitive sheets. We are further in possession of means to enable us to control the qualities of the tissue, to a great extent, by allowing it to get more or less limp or moist. A piece of limp tissue sensitised over night, and allowed to dry in a not over-warm room, will work beautifully soft, while one with the same bichromate bath, first put in while crisp, will require the greatest care to avoid hardness and patchy whites. A difference in the strength of the sensitising such tissue can be made, of course, and also a change in the length of time it is immersed; either of these ways, or both in combination, will enable us to print good pictures from almost any negative. Mr. Johnson's new patent process also opens out a vista of still further improvement and simplification of results by means of slight differences of manipulation.

We have always laid stress upon the necessity for exactitude in photographic operations, so as to be able to clearly separate the facts of a single experiment, and so enable improvements or failures to have their true causes displayed in a manner that does not admit of doubt. We therefore put it to carbon workers whether, instead of having the uncertainty so frequently attending carbon, it might not be a step in the right direction to start with the tissue of an uniform degree of desiccation—say as dry as is possible without breaking it. It is evident that this must be an advantage, and assist in reducing failures to a minimum. What we should think likely to answer best would be to thoroughly dry the tissue every day before using, and place it in a tight-fitting tin case to keep out the atmosphere.

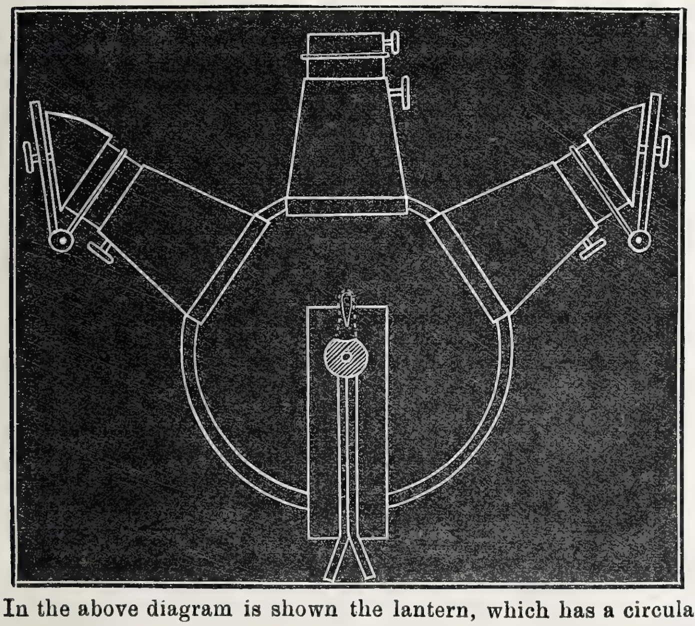
A good drying-box still remains to be invented. If we had such an one it also would be a help to uniformity of result; for the prevailing method of hanging up in a room does not easily permit us to be sure that from day to day we may depend on our tissue working smooth and always the same. That every endeavour to bring this about should be made we are quite convinced; for it is one of the stumbling-blocks to entering on carbon printing, into the ranks of which we feel assured there will be a perpetually-increasing number of aspirants.

BEECHEY'S TRINOPTRIC LANTERN.

We now redeem our promise of giving a detailed account of the trinoptric lantern invented by the Rev. Canon Beechey nearly thirty years ago, and which he used with excellent effect during several courses of lectures extending over ten years. By the use of this lantern he obtained a well-illuminated disc of fifteen feet; but, as he found it unsuited for one of twenty or twenty-five feet in diameter, he eventually gave it up in favour of three ordinary lanterns.

From what has already appeared it will have been noticed that the trinoptric lantern possesses, first of all, a lamp, the light from which radiates in an equal degree of intensity nearly all round. Arranged round this lamp, and in the same plane, are three optical systems, comprising condensers and objective, with a place in which to insert the picture. One of these points direct to the screen; the other two point to the sides, in opposite directions, or nearly so. By means of prisms attached to the objectives of these side systems the light from each of them is directed forward to the screen, upon which all three discs are so arranged as to be coincident. Having thus paved the way by giving this general description, we now proceed to details.

FIG. 1.



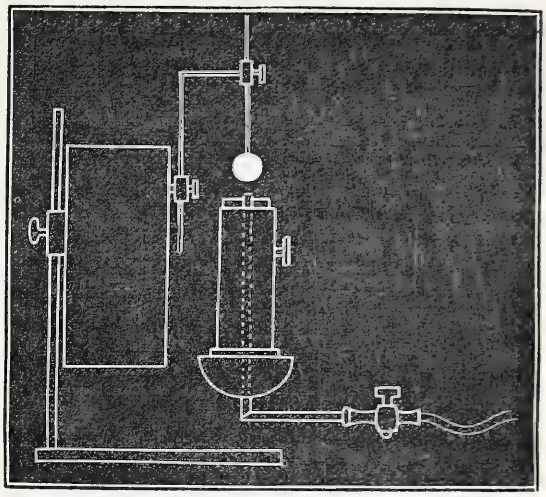
In the above diagram is shown the lantern, which has a circular body. The two side optical systems are fixed to the body in such a manner as to render it easy to rotate them round the light, so as to adjust their relative positions to each other. No matter how they are moved the light will always be in the axis of the condenser. The prisms have each an angle of 80°, this angle being found to give the most perfect reflection.

As it was Canon Beechey's intention to have, if necessary, all three systems in full illumination at the same time, the formation of the burner was evidently a matter of grave import. A lime jet of the ordinary kind, namely, that in which a cylinder is rendered partially incandescent by the impact of a jet of gas, was first of all tried; but, for a reason we shall explain, it was found to be quite inefficient.

In the diagram (*fig.* 1) we have shown the lime as a *cylinder*, in order that we may point out why Canon Beechey found it necessary to discard it in favour of another kind of light. It is well known that when the gas first impinges upon the side of the lime cylinder it emits a wide angle of light—sufficiently wide, it was found, to illuminate all three condensers in the above arrangement, although those at the sides were imperfectly lighted in comparison with the central one. But, after burning for a brief period, there is a hollow or indentation formed in the lime by the action of the gas, which hollow we have shown in the front of the cylinder in the diagram. Now, while this does not affect the quality of the direct illumination, namely, that which falls upon the central condenser, it acts fatally towards those at each side; for the sides of the indentation act as walls which intervene between the luminous spot and the side condensers.

All this difficulty was eliminated by making use of a fountain lamp supplied with olive oil. This is shown in the accompanying diagram (*fig.* 2). It is supported upon a rod, up and down which it slides for purposes of removal or adjustment. The wick is a circular one of about half-an-inch, or from that to five-eighths of an inch, in diameter. But the flame is not an Argand one so far as regards the principle of combustion discovered by Ami Argand; for when it is lighted *this* one is allowed to smoke—at least to a slight extent. Fixed to the bottom of the oil cup at the foot of the wick chamber is a small brass tube connected with an oxygen reservoir or bag, the passage of the oxygen being regulated by a tap, which is shown in the diagram. The upper end of the oxygen tube, which is carried up to the top of the wick, as shown by the dotted lines in the centre of the wick chamber, terminates with an aperture of about an eighth of an inch in diameter, or from that to a sixteenth. This aperture would be unduly large if used with an ordinary jet; but it must be borne in mind that in the one we are now describing the bag is not heavily weighted as is usual, no more pressure being put upon it than suffices to enable the oxygen to issue out in a gentle stream.

FIG. 2.



Suspended over the flame—and by the means which are so plainly shown in the diagram as to render description quite unnecessary—is a ball of lime. The relation of this ball to the flame of the lamp is such that when the lamp is lighted its flame will engulph the ball, the flame, as we have said, being of a dingy and smoky character. At this stage the oxygen tap is turned and a stream of this gas allowed to play against the lime ball. Instantly the flame of the lamp becomes greatly diminished in length, and, from being smoky and devoid of luminousness, it becomes intensely pure and dazzling; but not only so, for the lime ball, on becoming subjected to the heat of the oxy-oil flame, also becomes intensely luminous, and thus a light of a twofold kind is emitted from the lamp—an oil flame fed with oxygen, and that from an incandescent lime ball.

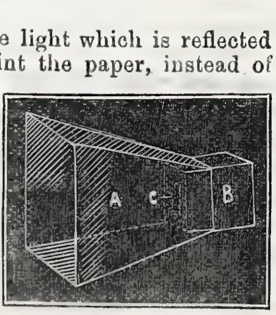
It need scarcely be observed that the lime ball is suspended upon a piece of platina wire. No other metal would be capable of standing the intense heat without fusing. The consumption of oxygen, notwithstanding the large aperture of the jet, is less than that of the ordinary burner, and from the low pressure the lime does not wear away rapidly. There seems, on the whole, to be much in this lamp and lantern that is worthy of admiration; and, although Canon Beechey has discarded it in favour of three separate and independent lanterns placed side by side, he entertains a strong opinion respecting its value for discs of less diameter than fifteen feet.

Mr. J. W. Leigh, in our last issue, raises a valid objection to the use of the carbonate method of reducing old negative baths, which, unless the nitrate is intended to be re-applied to the same purpose, gives a product which, from its containing iodide of silver in combination, is likely to lead to uncertainty. In recommending this plan as preferable to reduction to the metallic state, and subsequent solution in nitric acid, we had not in view the probability of the resulting silver nitrate being applied to other purposes; the special feature of this plan is its simplicity, which enables us to reduce and re-convert to its original use a disordered bath in a very short period, the whole of the operations being performed in the same vessel. This causes the carbonate method to be much used for that purpose. It is, of course, impossible to have everything exactly as we should wish it, and we cannot expect the simpler method to afford the perfection of result obtained by the more orthodox plan of reduction to the metallic state; moreover, it will generally be found that those who adopt the carbonate plan are the class who, as a rule, object to the operation of crystallising the nitrate thus obtained, and hence retain it, as Mr. Leigh himself does, in strong solution. This renders it improbable that the product will be used for emulsion purposes, while for printing we are by no means certain that the small trace of iodide present would produce any ill effect. We know that an old negative bath is said to, and does in fact, produce disagreeable tones; but this may be as much due to the ether and alcohol and other impurities it contains as to the iodide. However, if absolute purity be desired, we fear there is no doing away with reduction by heat. The methods of reducing the chloride by means of zinc, or other metal, and sulphuric acid are open to a similar objection to that raised by Mr. Leigh; portions of the chloride remain unconverted by the zinc, and upon re-solution of the silver in nitric acid are taken up by the concentrated nitrate solution. The same result occurs in operating in this manner upon bromide of silver, which is probably the least soluble of the haloids in silver nitrate.

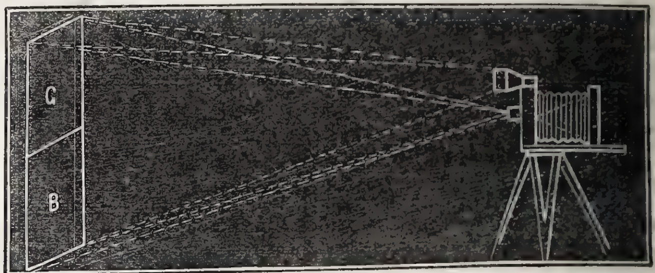
ACTINOMETERS FOR LANDSCAPE WORK.

All photographers will, I am sure, feel grateful to the Editors for the able leader in last week's Journal on this subject. The value of an actinometer as an adjunct to the outfit of a landscape photographer is, I think, becoming more recognised—more especially since the emulsion processes came into use, as the exposure of a plate by this process requires to be more accurately timed than is the case by the older methods. With a view to this I suggest the following adaptation, but am sorry, owing to lack of time and necessary light for making experiments, that I am only able to send it in the form of a suggestion.

The principle of it consists in using the light which is reflected from the objects being photographed to tint the paper, instead of using direct light. This, I think, may be secured as follows:—A is a light framework of cardboard, or other light material, made to taper at one end and open at both. The smaller end is made to fit loosely (so that it can be removed at will) on one of the small tin actinometers made by the Autotype Company, as shown at B. The slit exposing the sensitised paper is shown at C. The frame must be so made that when on replacing the actinometer by the eye the same amount of subject is included as is depicted on the ground glass of the camera to be used. The frame, in fact, becomes a view-meter, and will require adapting, like a view-meter, to every different focus of lens or shape of plate used. This may be secured by fitting the open end of the frame so as to receive a sliding front, which may have an opening in it to suit various lenses. The inside of the frame must, of course, be blackened.



To use the frame in connection with the camera it would be necessary to temporarily fix it as shown at A, so that it would, if used in that position as a view-meter, cover exactly the same angle of view; or, in other words, the eye would see the same objects and no others as those seen on the focussing screen. Suppose, for example, the square C B is the subject to be photographed. Let the camera be now arranged so that the square occupies the whole of the focussing glass, presuming it to be a square one. The instrument on the top of the camera is also arranged so as to include the same subject. This it will always practically do if kept parallel with the camera. We will further suppose the object to be of two colours—G green, and B blue. Now it is evident, as all light is excluded from both camera and actinometer except that reflected from G B, that both will receive the same value of light, viz., a mixture of green and blue. The light falling on the sensitive paper will cause it to tint at the same time the plate is being exposed in the camera, though, of course, the tinting will proceed by no means so rapidly as in the case of direct light, so that it may, with rapid plates, be requisite only to tint to a certain depth. Should it be desired to expose for the least actinic portion, G, the instrument may be arranged to include only that portion, in which case the over-exposure of the B part will have to be corrected in development.



As an instance of the value of such a piece of apparatus for out-door work, suppose the subject to be photographed was a dark ravine, archway, &c., while the camera itself was out in the open sunlight. In such a case using direct light for the actinometer would be simple nonsense, unless the number of tints requisite to secure an impression of the darker part of the view had been ascertained before by trial, which, of course, is out of the question, as one might as well work with a wet plate at once. However, the apparatus I suggest—which, by the way, some one else may have used years ago—would, I think, remedy this, as all the light that would reach the sensitive paper would be from the dark portion of the view itself, and not direct light. The same would hold good *vice versâ* if the photographer stood in a dark place and looked out to a well-lighted view.

I am aware the addition to the actinometer I suggest is by no means so complete as it might be made by a few experiments, especially that part which fits on the actinometer itself. It would, necessarily, require a slight modification, as the actinometer would have to be taken out of the frame to see the progress of the tinting, and to alter the sensitive paper so as to expose a new portion, when required. But, as I said at the commencement, what I make now is merely a suggestion, leaving it to others having more time to perfect it. C. P.

FOGGING THE PLATE, OR AUXILIARY EXPOSURE.

This is the subject that has occupied the attention of photographers for a number of years. Generally it has been, not how to fog a plate, but how to prevent it; but of late it has been the correct thing to go scientifically to work to fog the plate and call it pre- or after-exposure. Many years ago it was proposed and, I believe, by some, put into practice to line the camera with white or some light colour. This was said at the time to shorten the exposure; and I have no doubt it did, as it would be sure to cause fog, more or less, and in that case the exposures were bound to be made shorter in order to escape the fogging properties of the white lining.

It is now about four years since Mr. Fry brought the matter again prominently forward at the technical meeting of the South London Photographic Society, and he there proved that by fogging the plate it answered the same purpose as a longer exposure in the camera. Since then there has been no end of contrivances to effect this fogging, each practitioner having his own pet way of doing it. Now, to me the curious part of the matter is that so much time and energy have been occupied on so simple a matter as the fogging of a plate, and this term, I know, does not sound so scientific as pre- or post-exposure, still it is all the same thing.

As I never walk round a field if I can get across it, so I always try to accomplish the end in view with the means at hand, rather than go out of my way to seek fresh ones. So when I wish to give a pre- or after-fogging, I, at the time of taking the plate out of the box (for, as the Editors know, I never use a bath) or out of the dark frame, according as I intend it to receive a pre- or an after-fogging, instead of shutting the dark room door leave it just a wee bit open—merely sufficient to admit a little diffused light. This is quite sufficient to answer all the purposes of coloured glass caps to the lens, and all the other extraordinary arrangements to accomplish this very complex and desirable end—fogging the plate.

I enclose you an example of a fogged plate. I had no wish to fog it altogether, so I proceeded as follows:—I covered one portion of it, then opened the door as above for two seconds, placed the plate in the frame under the negative, and exposed for the fraction of a second, with what result you will see. R. KENNETT.

[The result referred to by Mr. Kennett is excellent.—EDS.]

NOTES ON PASSING EVENTS.

By a Peripatetic Photographer.

For performing thorough work commend me to the man with a hobby—that is to say, the man who makes a hobby of a particular kind of work. He is certain of viewing and treating it under every aspect from which it can be contemplated. No one individual appears to have made a special "hobby" of the spots which unfortunately make their occasional appearance in washed emulsion plates; but it is exceedingly gratifying to find that this plague is affording a subject for investigation to a great many skilful experimentalists. Of the ultimate result of such united action in unearthing a mystery there can be no doubt. Spots form the only drawback to this process being rendered perfect. When is Mr. W. B. Bolton, the able discoverer of this most useful process, to lift up his voice in the matter and proclaim that spots shall be no more? Having done so much for us will he not do a little more, and render perfect the work he has not only begun but so nearly finished?

With reference to one of the items in the comprehensive patent recently obtained by Mr. J. R. Johnson—that in which he provides for the settling down of the coarser particles of pigment by laying the tissue for some time upon a warm and level slab, so as to allow of these denser particles subsiding to a lower stratum for the purpose of having the least dense pigment on the surface—I should have thought the same end might be effected in an easier manner by allowing the trough of liquid pigmented gelatine to remain stationary for a short time previous to immersing the band. Will not *this* allow the denser particles to fall to the bottom—at least, to such a distance from the surface of the fluid material in the trough as to prevent any of these particles being taken up on the roll of paper which is slowly passed over the surface of the gelatine in the course of its conversion from the primal state of plain paper to that of carbon tissue?

The South London Technical Exhibition seems to have been unusually successful this year, if one may judge from the published reports of that meeting. Among the matters that do not appear to have found a chronicler was the fact that the President of the Photographic Society of Great Britain formed one of those who were present on that occasion. This, I venture to say, showed an excellent spirit on his part, and one which must have been appreciated by the members. It is the first time, I am informed, that a president of the "parent" society has ever been present at a meeting of the South London fraternity.

The magic lantern seems to be in the ascendant at present. On the introduction, by Mr. Woodbury, of the Marcy sciopticon into this country a deathblow was struck at the time-honoured Argand burner, and at present the number of lanterns fitted with the latter lamp is exceedingly limited. This I am enabled to state after a conversation with an extensive dealer. We are indebted for numerous excellent things to our American brethren, and it is only fitting that such an acknowledgment be freely made. The numerous "changes" which have been, or may yet be, rung upon the sciopticon idea does not in the least detract from the merit that must be accorded to the original inventor, whose lamp has never yet been surpassed in its purity and intensity by any lamp having a like number of wicks.

It is on the *tapis* that a new form of actinometer is about to be introduced. So far as I can ascertain it is to be of the dimensions of a thin Geneva watch, having a dial graduated in a certain form. It is intended to be carried in the pocket like a watch, and will be constructed with a special view to the requirements of the landscape photographer, who, when about to take a view, will previously pull out and inspect his actinometer, by which he will ascertain the number of seconds or minutes, approximatively, required for the exposure in the camera. Of all sorts of pest the anticipatory pest is the worst; so I shall not indulge in any vaticinations as to a piece of apparatus certain to receive a warm welcome from numerous practitioners of the black art.

Having devoted a few hours last week in making experiments with the auxiliary-exposure cap, the record of an experiment may prove useful. I made my cap of cardboard, which, by the way, forms a very light and useful lens cap. I then, by means of a gun-wadding cutter, punched a hole in the centre, of the diameter of sixpence, and pasted over it two thicknesses of white tissue paper. This papered aperture was covered by a second small cap constructed in a similar manner to the little caps adapted at one time for old-fashioned large landscape lenses having small stops in front. This I found to give better-marked auxiliary exposures than any other cap I have yet tried, including those having paper of a violet colour. I have thought of a great improvement that may be applied to this kind of hankey-pankey camera work, and which I have serious thoughts of securing by patent, and then starting abroad to scatter it broadcast (for a *quid pro quo*) among my benighted brethren on the continent and in the colonies. There are obvious reasons why I should not do so in this country; "burnt bairns dread the fire," says the old northern proverb. Well, my improved cap is as follows:—Provide one of the ordinary flap lens shutters, which is thrown up and down over the lens by means of a milled head on the axis of motion. But instead of having only *one* flap this must have two—the outer one being opaque or metallic throughout; the inner one having an aperture such as I have described as being "glazed" with the tissue paper. It works in this way: raise both flaps for the main exposure, or that to the sitter; then drop the inner or perforated flap, allowing it to remain in action the requisite number of seconds; then complete the exposure by closing down the outer flap. Can anything be more perfect than a flap shutter constructed in the manner I have here described?

(To be continued.)

THE ART OF PAINTING ON THE PHOTOGRAPHIC IMAGE.

No. XIV.

The flesh-tints will now probably require strengthening with various tints of Venetian red and white, raw umber, Venetian red and white, raw umber and white, &c., &c.; and wherever the colour looks abrupt and jagged it should be joined together, as it were, with suitable touches. The glazes of *terre verte* may be "painted into," as it is called, with touches of vermilion and white—very delicately, though, so as to make an almost imperceptible variety of colour.

Examine, now, carefully through your lens the touches of deep colour about the eyes. See that you get the shape of the eyelids exactly right; the line along the top of the upper eyelid is quite a little study in itself. Note carefully where it is soft and vague, where it loses itself, and where it is sharp and well defined. Mark this in with raw umber and Indian red; or, in extreme cases, where the surrounding parts are very dark, black and Indian red, or sepia and Indian red, may be used. Note the bluish-grey tint generally found between the eye and the nose at its lower corner; this, in ladies and children, is well given by ultramarine ash—a beautiful, neutral grey blue. Examine your guide now for the pupil and iris of the eye, especially as regards the position of the former and its shape; as to size you may generally make it a little larger. The outer rim and the darker part under the eyelid should show the local or blue colour in a blue eye, and the transparent part should be a little warmer. Having a good foundation of orange or warm brown for a hazel eye, it should be shaded up in the dark parts with Vandyke brown, plenty of medium, and a little dryers, as Vandyke brown is a bad colour for drying; so are ivory black and rose madder. Perhaps the last is the worst of all, but it is very useful and to be relied on as permanent. In this stage of the painting a glaze of it over the cheeks and lips is very beautiful. Regarding the spark in the eye, do not make it too large nor yet a mere round speck; it is generally triangular or pear-shaped—sharp and bright at the broad end, but usually trailing off softly at the small end.

In strengthening up the colour on the nose leave the high light sharp and clear in some parts and softer in others, according to the guide. Mark in firmly the nostril. The shadows in the ear are generally reddish, owing to the semi-transparency of the gristle of which it is composed. Look attentively to the line between the lips.

Keep all reflected lights warm, except where some cold substance is manifestly reflected into them.

Now go into more detail with the hair. Sometimes a glaze of brown or of neutral grey, as the case may be, taken all over it is good to commence with; into this tenderly and carefully paint all the little details. In the case of a lady's hair you may, if it look rough and broken up, make it smoother and brighter with advantage. Avoid a ropey look. If you have got it to look a little too even a stroke or two of dark in the light, and light in the dark, can easily be made to remedy that.

Now is the time to paint the draperies in their proper colours on the grounds prepared for them. I have found black draperies best finished off at this stage in the way already described. Coloured draperies may at this stage be boldly mapped out (carefully, though, as regards drawing and detail), but of some colour in reference to after glazings, crimson may be painted with a tendency to scarlet, greens made yellower than ultimately intended to be, and purples redder. Now, also, is the time to glaze your background and to paint into it with broken colours, if thought desirable. If a pattern be introduced to indicate a figured paper or other wall decoration—say a *fleur-de-lis*, for instance—a piece of stoutish cardboard should be taken and a stencil plate made by cutting out the intended figure, through which it can be traced on to the canvas, the latter being divided into squares to ensure the proper repeating of the pattern; this may be done temporarily with white chalk. In painting the result of these tracings take care not to make them too distinct, and only showing two or three in light; the others more or less lost in shadow, and some quite vague, especially towards the upper corners—almost requiring to be looked for, in fact. On the same principle, if a panel be introduced let it lose itself towards the top of the picture, and, indeed, should not be too sharp or brilliant anywhere.

Next week I will treat of the third or finishing painting.

JOSEPH WAKE.

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NOTES FROM AMERICA.

FADING OF PRINTS.—SOAP AS A LUBRICATOR.—ALBUMENISING PAPER.—PRINTING AND TONING.—HOW TO PAINT BACKGROUNDS.—RETOUCHING AND BURNISHING.—IMPROVEMENTS IN RETOUCHING.

WRITING in the *Philadelphia Photographer*, on the fading of silver prints, Mr. F. M. Spencer observes that, while Mr. Clemons claims that his alum bath eliminates all the soda in the act of hardening the albumen, he (Mr. Spencer) prefers not to harden the albumen more than necessary, as it injures the transparency of the shadows and brilliancy of the print. He has a frame of thirteen prints exhibited at Cleveland in 1870, every print being today as fine in tone and pure in whites as when made, and the test has been severe, including more than a continuous exposure to direct sunlight for a year. While he is not prepared to say that *soap* as a lubricating agent may, or does, cause fading or spotting of prints, he thinks it not only safer to avoid the use of alkaline compounds, but better to use *white wax* or *paraffine*. Make a saturated solution in ether, and add a sufficient quantity to the alcohol—an amount equal to one to five grains of the wax to each ounce of the alcohol—and apply in the usual way. Use the burnisher hot. It is nonsense, he says, to suppose that the burnishing will make the prints fade; on the contrary, if wax or paraffine be used for lubricating, it protects the surface from atmospheric agents, and renders it more permanent.

He refers to a suggestion that had been made respecting the advisability of photographers preparing their own albumenised paper, to avoid what has been designated "rotten-egg papers," and says:—

The photographer must do a "custom-house" business to afford to albumenise his own paper; it costs too much for eggs, even at ten cents per dozen, to always have *fresh* paper, and do it yourself. It has been my fortune to pay Mr. Clemons's laboratory numerous visits to see the whole process, and I discovered that albumenising is a trade of itself, quite sufficient to occupy and try any one man's patience. I always order my paper from him *direct*, and never fail to get a fresh lot, and, what is more, it will keep fresh for months if kept in a moderately dry room. Albumenisers have noses quite as long, if not as keen, as Mr. Webster's, and I don't believe they want to stand day in and day out over half-a-dozen trays of *rotten eggs*. If photographers would buy direct from the albumeniser, and take proper care of their paper when they get it, we should hear of no complaints. Perhaps some one is ready to ask for my formula for working Clemons's paper. I believe any formula that will work any paper well will do. I believe the best positive bath for *any* paper is pure water, pure silver, forty to fifty grains to the ounce, according to the season, and made slightly alkaline by ammonia; and, should the albumen be disposed to dissolve into the bath, add alcohol (pure) until cured. It will not require much at any time (alcohol containing fusel oil ought to be rejected for any purpose, except as a convenient poison for a played-out class of "pictur takers.") Float just long enough to get strong prints, hang up until *surface* dry, and complete the drying by heat; fume from seven to fifteen minutes, print and *trim*, and tone in a bath of water enough, gold solution the same; but it might be well to say here how to prepare it correctly:—Dissolve a five-dollar coin in muriatic acid, three ounces; nitric acid, one ounce. Evaporate carefully to dryness, being *very* careful at the last not to heat the evaporating dish too hot, as a portion of gold will be decomposed and sent back to its "normal condition;" redissolve in twenty-four ounces of soft water, filter, and add half-a-drachm of muriatic acid and a table-spoonful of salt (sodium chloride). When ready to tone, pour enough of the gold solution to tone in about ten minutes, and neutralise with bicarbonate of soda. It will turn a greenish colour, but it will do no harm; it clings like death to its oxygen, and goes to the bottom of the dish. Well, having done this, add enough water to complete the bath. Now a tablespoonful of salt must be added next and last, and then tone; no need to wait, provided the prints are *well* washed, and reddened by acetic acid in the first water, one ounce to the gallon, or two tablespoonfuls of salt dissolved in the *last* wash water *but* one. Tone until all the shadows in the face clear up, remove to a rather large tank of clear water, and, when all or a sufficient number of prints have been toned, fix in a hypo. bath of standard strength for ten minutes, keeping the prints *constantly moving*, and *completely* covered by the fixing solution. At the end of ten minutes take up the prints all at once, and drain quite dry, or quickly pass through a clothes-wringer, and pass them to a strong salt bath, in which they should be kept moving from three to five minutes, when they must be removed to the washing-tank, and washed not less than five hours or over night if the water be cold, after which they may be mounted, dried, burnished, and delivered to the customer.

A few practical notes on backgrounds are contributed to the *Phil. Phot.* by Mr. M. H. Albee:—

I will (he says) now give you some ideas how you can utilise your time, and get things to help to make a picture. Backgrounds do much towards securing good effects; also rustic fences, which can be made out of any crooked sticks; and also rocks made of old boxes and covered with sacking, and then with cloth pasted on and sized with glue size, being then painted with oil paint and sanded. The backgrounds you can do by sizing your cloth with glue size, with a little alum in it, but do not use this size to mix with your colour; glue size without the alum will work the best. First, coat in your groundwork, then use your colour weaker with glue size and all subsequent additions, until you have accomplished your purpose. It is quite as well to draw in your design with chalk before taking in hand the colour, if it be not handy for you to work without the chalk marks. The colours best to use are raw umber, black, and whiting, mixed to your fancy with glue size.

In writing (in the same journal) concerning the touching-out of spots upon pictures, Mr. John L. Gihon has some good and practical remarks:—

For plain photographic work (he says) I advise you to have by your side a palette, upon which are ground moderate portions of a good *black* India-ink, warm sepia, and scarlet lake. With combinations of these you can readily imitate the photography upon which you are working, whether it be cold or warm in tone. Of course it is necessary to apply these tints with a brush, and if you use plain water as a diluent you will leave a dead surface that betrays your trail. Every one will exclaim—"Why not, then, use gum water? That will leave a gloss." Perfectly right, but it leaves too much gloss. In addition, I don't believe that the half of you know how to make gum water. Accept my formula, and adopt it or not, as you see fit:—

Picked gum arabic	1	ounce.
Loaf sugar	1	drachm.
Acetic acid	30	minims.
Alcohol	30	,,

Water in sufficient quantity, say from six to eight ounces. Don't be frightened at the mention of the acid, and at the idea of putting a modicum of it upon the surface of your photograph. Used in this way it will not, I assure you, prove destructive in the slightest degree. The gum water, however, I do not use for the indicated purpose. There is a better vehicle—the much-abused, always useful, *albumen*. I have before this published a method of making a stock of albumen that is equally as serviceable for this as it is for many other purposes. It is not original with myself, but I have used it for many years, and have come to consider it indispensable in a studio or gallery:—Take the whites of eight eggs, carefully separated from their germs, and add to the mass twenty-four drops of glacial acetic acid diluted with one ounce of water. Stir well for a minute with a glass rod, making no attempt to beat into a froth. Let the liquid rest for at least an hour, and then strain through cambric muslin. Finally add half a drachm of liq. ammonia *fortis*, bottle, cork tightly, and use as required.

Slightly diluted with water nothing can excel this as a vehicle for water-colour painting upon albumenised paper. Of its utility for the preparation of negative glasses, for transparencies, and for porcelain work I have already spoken. If you cannot touch out the spots neatly you had better allow them to remain. On numberless occasions I have seen prints from what were supposed to be good negatives, that might readily have passed for maps of the heavenly constellations. They were filled with white spots, crescents, and lines. I have frequently asked the privilege of inspecting the plates from which they were made. In most instances the printer had endeavoured to conceal small pinholes or light scratches with that very useful paint of my manufacture (opaque), and, instead of having a scarcely-descernible dark speck on his paper, caused the appearance of a white blot somewhat difficult to eradicate. To remove these transparent imperfections upon the negative you must possess a sharp eye, a steady hand, a fine brush (opaque, of course), and a clear comprehension of what you are doing. Almost invariably when I have washed away the colour that had been applied I have found that at least three times the necessary quantity had been used.

We are now to snppose that our pictures are approaching completion—that, in fact, independently of the sale or final disposition of them, but two more processes are required. The one treats of the application of a lubricator; the other involves the matter of burnishing—an operation that has been considered of sufficient importance to induce legal battles between the patentees of differently-arranged machines. Both items may be speedily disposed of. Lubrication means the dabbing upon the surface of the photograph a preparation that will, after further treatment, enhance its brilliancy. All such compositions are alcoholic, and many have been proposed; but, as is usual in such cases, the simplest seems to answer the purpose best. Scrapings of white Castile soap dissolved in alcohol answer every purpose, and probably make as good a medium as can be selected. The method of application is equally simple. Saturate a tuft of cotton, and with it gently rub over the surface of the pictures. When nearly, if not quite, dry they are ready to be passed through the *burnisher.*

In *Anthony's Photographic Bulletin* an article on *Improved Negative Retouching*, by Mr. Frank E. Pearsall, will possess interest for a large section of our readers. He says:—

In giving freely to the fraternity the results of my recent studies on retouching, my only object is the elevation of photography by more truthful work. Having taught several who are now holding responsible positions as negative retouchers, I am encouraged to believe that what I am about to offer will be found by all who adopt it a very great advantage; and if those who may receive any benefit will simply acknowledge it I shall be amply repaid, for by so doing they will command the attention of those among us who are loth to try anything new. Great difficulty has been experienced in acquiring a perfect knowledge of retouching on negatives from the falseness of the light transmitted through the image by the ground-glass screen. It matters not how fine it may be ground it is but a roughening of the surface, forming numerous little cells, each one producing a minute lens, which throws a different angle of light, not only dazzling and affecting the eyesight but confusing the judgment, making it very difficult to critically estimate the value of any touch, and often causing the negative to be very much overdone; as one false touch, being inharmonious, necessitates so many more that the likeness is generally destroyed. To overcome this uncertain and, as many claim, hurtful labour to the sight, and make it a pleasant, intelligent work, discard the false ground-glass screen and substitute for it a washed iodised plate. Every photographer can make one of these screens for his retouching-frame by coating a glass as for a negative; when ready to remove from the bath, place under the tap, wash well, and varnish, placing it in the frame with the collodion side from you to prevent its being scratched. This will give a perfect and true screen. Its peculiar opalescent character will offer the most critical examination of a negative when placed behind it; and, viewed by transmitted light, as it were, the two films seem to amalgamate and closely resemble a negative before fixing. A soft, delicate, steady light is secured, resulting in no injurious effects to the eye, revealing most perfectly all the detail in the deepest shadows, with an additional advantage which the artist has of a perfect plane to work upon, all parts of the image appearing at an equal distance. This is not the case with ground glass, in which all shadows or transparent parts, when placing the pencil point upon them, seem to recede, leaving only the ground surface to the view, and therefore making it quite impossible to discover any detail in the deepest shadows. This fact can easily be demonstrated by viewing a negative first with a ground then an iodised screen behind it.

PHOTOGRAPHY IN COURT.

THE WOODBURY PERMANENT PHOTOGRAPHIC PRINTING COMPANY *V.* DE LA RUE AND CASSE.

In the Bloomsbury County Court, on the 22nd ult., the case of the Woodbury Permanent Photographic Printing Co. against De la Rue and Casse was heard, in which the company, carrying on business in Great Portland-street, sued the defendants, described as publishers, of 5, Percy-street, Tottenham Court-road, to recover the sum of twenty guineas under the following circumstances:—

Messrs. Dod and Longstaff, appearing as solicitors for the plaintiffs, stated that early in May last the defendants sent them twenty-eight negatives for the purpose of being copied by their process, with the request that the proofs were to be forwarded as soon as possible, no specified time being given for the completion of the order. The matter was at once put in hand, and proofs were from time to time supplied as soon as they could be printed.—In answer to the judge, as to the time the proofs were sent, the plaintiffs stated that, as their process was a very tedious and difficult one, a proof of any negative could not be supplied under a week, as it would take three or four days to prepare the gelatine alone.—On the 25th and 28th of May and the 4th of June the plaintiffs asked, when the last instalment of proofs was sent in, if the defendants would give them references before printing 100 copies. References were given, and not proving satisfactory the plaintiffs required a check on account; but, not receiving it, they refused to proceed further, and eventually were obliged to bring the present action.

In cross-examination the plaintiffs said fifteen shillings was the price of each proof. The cost consisted in making the blocks and reliefs; printing additional copies was attended with but trifling expense afterwards. On the 16th August the defendants had complained of some of the proofs being defective, but that was entirely the fault of the negatives and not of the printing.

Ed. Weir, the plaintiffs' traveller, said he had delivered part of the proofs, and on the 5th July applied for the account, which was promised in a week. He called several times for it, and no objection was ever made to the proofs being defective.

In cross-examination witness admitted defendants' offering to pay £5, which he treated as a joke; but told them they could have a hundred for twenty guineas if the account was paid. The defendants never refused the proofs. This was the plaintiffs' case.

The defendant said he rejected fourteen out of the twenty-eight proofs sent as being imperfect. He told the last witness this when he called in July, and on the 3rd September he wrote to the plaintiffs to the effect that if 100 good copies were supplied a cheque would be sent for twenty guineas.

The judge here said that, if the defendant relied upon the proofs being imperfect, he must produce the imperfect proofs in court, and prove that they were so.

The plaintiffs' solicitor urged that, if there were any imperfection in the proofs, it was entirely attributable to the faultiness of the defendants' negatives.

At this stage of the case it was suggested by the defendants' solicitor that, to settle the matter, the fourteen proofs should be taken at 15s. each. On the suggestion of the judge an arrangement was come to that the defendants should agree to a judgment for twenty guineas with costs on the higher scale; but, if the sum of ten guineas with costs be paid by the defendants within a week, the plaintiffs would undertake to proceed no further in the matter.

SINGULAR FRAUD ON THE FRENCH GOVERNMENT.

At Bow-street, on Saturday last, the 1st inst., Charles Hibbert, a gentlemanly-looking man, was charged, on an extradition warrant, before Sir James Ingham, with forgery to a large extent on the French Government. M. Moreau and M. Bourdauchaon appeared for the French Government; and Mr. Blanchard Wontner appeared for the prisoner. It appeared that on the 10th of June, 1876, the prisoner negotiated four bonds on the Trésor Publique de France with Messrs. Cardiers, banquiers, 108, Rue Richelieu, Paris. He received for these bonds on one occasion 60,000 francs, and on another 14,083 francs 55 centimes. He received the last payment on the 16th September, 1876. Paul Auguste Antoinne Nestor Créciat, Clerk in the Ministere de Finance, Paris, said he originally wrote the four bonds negotiated by the prisoner. Since then all the figures had been altered. Each bond had originally been of the value of 1,050 francs, and now they were marked, two for 20,600 francs, and two for 18,540 francs.—M. Alfred Gobert, principal clerk in the bank of France, and expert in handwriting to the French courts, said he had carefully examined the bonds produced, and had found that the alterations had been made by chemicals. They were so cleverly done that the alterations were not discernible to the naked eye, but by applying other chemicals witness discovered the frauds. Photographs had been taken of the bonds after witness had applied his chemicals, and these photographs showed both the original figures and the figures that had been made by the forger, who had altered them. These photographs were produced in court.—The case was adjoured for a week.—*Echo.*

FOREIGN NOTES AND NEWS.

Simple Way of Preparing Chloride of Copper.—Dr. Anton Beck.—Herr Lemling's Process: the *Patentblatt.*—Carbonate of Soda as a Preservative of the Whiteness of Albumenised Paper.—The late Photographic Exhibition at Amsterdam.—Wages in Japan.

According to the annual of the *Frankfurt Physikalischer verm,* chloride of copper may be very easily prepared by adding to a solution of sulphate of copper as much common salt as it will dissolve when hot, throwing in a few small strips of copper and boiling fiercely for about ten minutes. The fluid is then poured into a filter, and the filtrate is allowed to fall, drop by drop, into a vessel containing cold water. There the chloride of copper, being insoluble in water, is thrown down in the form of a delicate snow-white powder.

Dr. Anton Beck, the Director of the Imperial State Printing Establishment, at Vienna, has been created by the Emperor a knight of the order of Leopold.

In a communication to the Vienna Photographic Society, Herr Lemling, of Marmagen, speaks very highly of a process for producing, by daguerreotype etching, direct impressions having fine half-tones, by printers' ink from the image got in the camera. This process was elaborated by Herr Lemling by means of experiments extending over a series of twenty-seven years; and his communication gives a list of its advantages over other processes, but no hint as to the *modus operandi*. The new method is said to require no expensive apparatus, and the negative process is easier than those usually practised; the development process is also simpler, and the conversion of the negative into a printing plate may be postponed to suit the convenience of the operator, as he has successfully converted negatives into printing plates months after the former were exposed in the camera. The operation of making printing plates lasts for a few hours; but several dozen plates may easily and conveniently be converted simultaneously, and the work is unaccompanied by any offensive vapours or odours or by heat. When once the original negative has been obtained there is no longer any dark-room work, nor is a photometer or any similar contrivance requisite, since one can see clearly how the work progresses in the conversion of the negative, and when a printing plate has been produced the inking and printing are easy. In the production of a specimen that accompanied the communication the inking and printing were done by hand without the intervention of a press at all, and the whites of the pictures did not require to be cleaned after each impression had been taken, as they did not take on the ink at all.

Most likely we shall soon see the specification of this wonderful process, which, if it act up to its profession, is worthy of a patent, figuring in the *Patentblatt*. This *Patentblatt* is the new gazette or sorely-needed official organ of the German patent office. A specimen number has just come to hand, beautifully got up, and printed in clear, readable type upon tinted paper—the paragraphs arranged so as to stand out distinctly from each other and facilitate reference.

In the *Archiv* the credit of having first recommended blotting-paper saturated in carbonate of soda as a preservative of the whiteness of silvered albumenised paper, claimed by a correspondent in a recent number of the *Philadelphia Photographer* for Mr. M. Carey Lea and the late Herr Grasshoff, is re-claimed for a Herr Leyendecker, of Mosel.

The same number of the same journal contains an account, by Dr. Liesegang, of a day spent at the Isle of Wight with Mr. Jabez Hughes.

The *Mittheilungen* and *Archiv* contain reports of the decisions of the jury of the late photographic exhibition at Amsterdam. There were not so many exhibitors as had been expected; but, as some familiar names occur in the prize list, we append that document:—

The town of Amsterdam's gold medal, for which foreigners could not compete, was awarded to Herr Oosterhuis, of Amsterdam.

The gold medal, offered for the most artistic or technically-interesting exhibit, was awarded to Herr Rocher, of Chicago.

A gold, a silver, and two bronze medals were offered for photographs printed by a press in fatty inks. None of the exhibits were, however, considered worthy of the gold medal, so it was not awarded; but Herr Rommel, of Stuttgart, got a silver medal, and Herren Cadot, of Brussels, and Hameter, of Dordrecht, bronze medals.

For enamels a silver medal was awarded to Herr Leisner, of Waldenburg, and a bronze medal to Herr Geldmacher, of Frankfurt.

For carbon pictures the silver medals were awarded to Herr Gutekunst, of Philadelphia, and the Brothers Täschler, of St. Filden; bronze medals to Herren Greiner and Offenberg, of Amsterdam, and Hameter, of Dordrecht. The fourth bronze medal was not awarded.

For the best large direct photographs (measuring at least 27 × 21 centimetres) one bronze and two silver medals were offered and awarded—the silver medals to Baron Stillfried, of Yokohama, and Herr Kiewing, of Stettin; the bronze medal to Herr Niekerk, of Amsterdam.

The two silver medals for enlargements were not awarded, the jury not considering any of the exhibits in this department worthy of a silver medal. Two bronze medals were given to Herren Koch, of Neuwied, and Offenberg, of Amsterdam; the other two bronze medals were withheld, for the same reason as the silver.

Two silver and four bronze medals were offered for the best portraits (no matter what size, preference being given to those unretouched). To these the jury added a third silver medal, so that Mr. Samuel Fry, of Surbiton, London, Herr Bergamasco, St. Petersburg, and J. B. Feilner, Bremen, were awarded silver medals; and Herren Kirch and Büttinghousen, of Amsterdam, bronze medals.

For landscapes the three silver medals were awarded to Mr. Penn, of Octacamund (British India), M. Armand Dandoy, of Namur, and Herr Hallez, of Dinant; the bronze medals to Herr Niekark, of Amsterdam, M. Boumans, of Maastricht, and Herr Stöckel, of Rönne.

The only medal, a bronze one, awarded for animal studies was secured by Mr. David Hedges, Lytham. The two silver and other three bronze medals were not awarded. A similar fate met the silver medals for microphotographs, Herr A. Bakker, of Laandam, getting a bronze one.

No medal was awarded for reproductions from oil paintings, there being only two exhibitors in this department—one of whom, Herr Mottu, being a member of the jury, was *hors de concours*, and so was the other, Herr Oosterhuis, he having been awarded the gold medal mentioned first in the list for the general excellence of his productions in silver and carbon.

For the best photographs upon glass a silver medal was awarded to Herren Reichardt and Lindner, of Berlin; and bronze medals to Herren Hameter, of Dordrecht, and Bauer, of Middelburg.

A silver medal was awarded to Herr Beyrich, of Berlin, for chemicals, and a bronze medal to Mr. George Hare, of London, for his camera.

Bronze medals were also awarded to Herren Groote and Dudok de Wit, both of Amsterdam, for the most interesting collection of photographs not produced by the exhibitors.

The total number of medals awarded was two gold, thirteen silver, and twenty-two bronze. Prizes were taken by about three-fifths of the exhibitors.

In *On Things in General*, in the number of the 23rd ult., "Free Lance" remarks that from the rate of wages in Japan that country must be a perfect Arcadia for photographers. But he forgets that if wages are extremely low a different person has to be employed for each operation, as the man who cleans a plate cannot coat it, and he who coats the plate cannot wash the prints nor do any other thing unconnected with his branch; so that in the end it might be as cheap to employ one assistant in this country at thirty shillings a week, or even at two pounds, as six or seven assistants at wages varying from half-a-crown to fifteen shillings.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
Dec. 11	Great Britain	5a, Pall Mall East.
,, 12	Glasgow	Religious Institution Rooms.
,, 12	Cheltenham Amateur..........	Savings' Bank.
,, 13	Manchester.......................	Memorial Hall, Albert-square.

LIVERPOOL AMATEUR PHOTOGRAPHIC ASSOCIATION.

The annual meeting of this Association was held on Thursday evening, the 29th ult., at the Free Public Library, William Brown-street,—the Rev. H. J. Palmer, President, in the chair.

The Secretary reported what had been done at the meeting of the associated literary, scientific, and art societies of Liverpool in regard to the intended *soirée* to be held in St. George's Hall on the 14th December. Twenty-three societies were associating together, so that there was no doubt the *soirée* would be a great success. In order that photography should be well represented it was desirable that those having anything of interest connected with photography which they were willing to exhibit should at once notify the same to the Secretary.

The minutes of the previous meeting were read and passed.

The Secretary then read the following

ANNUAL REPORT.

In presenting the fourteenth annual report the Council have again to congratulate the Association on its continued prosperity. Eight new members have joined, and only three resigned.

Our meetings have been, on the whole, well attended, and though only a few papers have been read, a variety of objects connected with photography have been brought forward by members, which have been sufficient to sustain the interest of our meetings.

The presentation print has been chosen from a negative taken by one of our own members, and we are again indebted to the kindness of Mr. O. R. Green, who has placed at the disposal of the Council one of his enlarged negatives of *The Arch of Constantine*. This will be printed from in carbon during the ensuing spring.

The President, in his opening address, gave an account of his experiments in search of a substitute for glass for dry plates, and a paper was also read by Mr. J. H. T. Ellerbeck on the same subject.

Papers on *Comparative Experiments with Various Dry Plates*, by the President; *On the Use of the Actinometer with Dry Plates*, by Mr. J. H. T. Ellerbeck; and *Another Method of Working the Gelatine Process*, by Mr. H. Houlgrave, have been read, and a practical demonstration of Mr. Leach's enlarging process was given by the President.

A number of tissue negatives, kindly lent by Mr. L. Warnerke, were exhibited, and a communication from him with reference to their development was also read.

This year it was decided to hold meetings in July and August, and, on the invitation of the President and Mr. Ellerbeck, these meetings were held at their respective houses. The weather on both occasions proved unsuitable for outdoor work; but, notwithstanding, the meetings were greatly enjoyed.

A Saturday afternoon excursion to Bidston took place in July last, and, although short notice was given and the day was dull and unfavourable, about a dozen members attended, and some satisfactory negatives were secured.

Our album has received some contributions, and there is still room for more. Owing, no doubt, to the absence of a lantern at our meetings there has been no donations to the collection of lantern slides.

The Treasurer's report will, doubtless, be considered highly satisfactory, there being a good balance in hand.

The Treasurer then read his report, which showed a satisfactory balance in favour of the Association after paying all expenses.

The President said that no doubt the members would be pleased at receiving such favourable reports from the Council and Treasurer; and he thought that, having a good balance in hand, there should no longer be any hesitation in purchasing a lantern, so that at any time the members could exhibit slides without having to make special arrangements for doing so.

It was agreed that a suitable lantern should be purchased.

The undermentioned officers were then elected for the year 1878:—*President:* H. A. Wharmby.—*Vice-Presidents:* Thomas Clarke and J. H. T. Ellerbeck.—*Treasurer:* A. Tyrer.—*Hon. Secretary:* Wm. Murray.—*Council:* Wm. Atkins, J. A. Forrest, W. King, Rev. H. J. Palmer, W. M. Pendlebury, E. Phipps, Rev. J. D. Riley, W. B. Roberts, L. W. Weber, Ed. Whalley, W. H. Wilson, and E. Twigge.

A vote of thanks was passed to the Library and Museum Committee of the Corporation for the use of the room in the Free Public Library.

Several actinometers were exhibited, but the most convenient and portable for dry plates appeared to be one made in the shape of a box about the size of, but a little thicker than, a penny. The lid was of glass painted a suitable tint, with a slit of clear glass, the box containing discs of sensitised paper. As soon as a tint had been obtained, by slightly turning the lid a fresh segment of paper was exposed under the clear glass, and so on until the disc was covered, when it could be replaced with another.

Mr. W. H. Kirkby exhibited a hot-water tin for drying washed emulsion plates. By drying at 150° or 200° he avoided a multitude of spots, which he was sure to get if he allowed his plates to dry spontaneously. Mr. Kirkby also exhibited a photomicrograph of a diatom taken on a dry plate, with an exposure of thirty minutes, by artificial light.

Mr. W. King showed an interesting view taken on the deck of the s.s. "Germanic" in mid-Atlantic. Mr. King said the exposure was twenty-two seconds, and though the steamer was going at a good speed no signs of motion were observable, the print being perfectly sharp.

Albums and views of the season's work were exhibited by Mr. Kirkby and others, Mr. Roper showing a number of photo-mechanical prints.

The meeting was shortly afterwards adjourned until the last Thursday in December.

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EDINBURGH PHOTOGRAPHIC SOCIETY.*

A special meeting of this Society was held in the usual place on Friday, the 15th ult., to witness an exhibition by Mr. York, of London, of Keevil's patent lantern. It was originally intended that Mr. York should have been present himself, when, as he has for several years been very liberal to the Society in supplying transparencies for the popular evenings, he should have received a hearty Scotch welcome. Business engagements, however, prevented his coming, and the exhibition was conducted by his representative.

The apparatus, which on this occasion included Young's patent oxygen generator, was very compact and portable, and consequently very suitable for a travelling lecturer. The general arrangements of the lantern were much admired, especially the method by which the dissolving effect was produced. The image produced by the prismatic lens, although as brilliant, if not more so than that produced by the direct lens, was to a certain extent wanting in definition, but the exhibitor explained that an alteration had been made by which that defect was entirely overcome, although, unfortunately, it had not reached Edinburgh in time for the exhibition.

The general impression of those present seemed to be that, when the improvement had been made, the lantern would be a decided acquisition to all interested in dissolving view exhibitions.

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VIENNA PHOTOGRAPHIC SOCIETY.

The first meeting for this season of the above Society took place on the 16th October,—Dr. Hornig presiding. After the minutes of the last meeting had been read and approved, and seven new members had been admitted,

The President called the attention of the meeting to a collection of lichtdrucks and photolithographs emanating from the laboratory of the Polytechnicum at Buda-Pesth. The first were impressions from a lichtdruck plate, prepared by Professor Husnik's process, which remained perfectly good after 600 proofs had been pulled from it. For comparison, the lichtdrucks were accompanied by a silver print from the same negative. The photolithographs were reproductions of some very fine and complicated collections of lines produced by vibration, and drawn by an apparatus constructed by Professor Jedlik. He (the President) then made some casual remarks on Herr Wilde's emulsion plates, and laid on the table the first number of the new organ of the German Photographic Society, the *Deutsche Photographen Zeitung*, with the remark that the illustration was a schnell-press lichtdruck by Herr Hoffmann. He also exhibited a picture from the same establishment, "The 363," of which, in a very short time, an edition consisting of 500,000 copies had lately been thrown off, the three days' product of a single press and plate being 3,000 copies for the first, 2,000 the second, and 3,000 the third day.

The wall space retained for the use of the Society at the forthcoming Paris exhibition formed the subject of the succeeding remarks, and was followed by an account of the polychromic lichtdrucks of Herren Albert and Obernetter, exhibited at the late exhibition at Nürnberg. One picture of a malachite vase, with gilt and bronze ornamentations on a dark background, attracted special notice. It was printed by means of four plates prepared from negatives. One plate served to print the drawing, a second the background, a third the green, and a fourth the bronzing. Specimens were passed round and examined with great apparent interest.

A communication from Herr Wisniowiski, of Cracow, on the production of printing plates with half-tones, was then read, and was followed by a paper by Herr Joseph Lemling, of Marmagen, on printing with printers' ink from plates with half-tones. To the last paper,

The President added that at the Nürnberg exhibition he had observed several frames containing what the catalogue called original Aubeldruck plates. These pictures had very much the appearance of ordinary paper prints protected by glass. When handled, however, they were found to be much heavier, and on opening one of the frames it was found to contain a thick sheet of plate glass, upon the back of which was a positive picture on what was recognisable as a collodion film. But it was said that experimentalists had been unable to get good impressions from them with printers' ink, as the whole surface took on the ink. If this were really the case it would add greatly to the importance of Herr Lemling's communication.

The Secretary then read a communication from Herr Wisniowiski, on *The Origin and Prevention of Dendrites*, which will be given in full in the next number of the *Correspondenz.*

A number of prints from glass plates were then exhibited, and were followed by a discussion on the productions of the State Printing Establishment at Berlin as exhibited at Nürnberg.

The question box was then opened, and the five questions it was found to contain having been answered, the meeting was adjourned.

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West Riding of Yorkshire Photographic Society.—This society held its third annual *soireé* on Wednesday evening, the 28th ult., at the Bell Vue Hotel, Bradford. Tea was provided by Mr. Clark in his usual first-class style. After tea (of which about seventy partook), the evening was spent in a social manner, songs, duets, and recitations being given by the members and friends (among whom were Mr. and Mrs. Hartley) in good style, the proceedings being conducted by the president, Mr. E. Greaves, of Halifax. A large number of photographs—many of a very large size—were exhibited by the leading photographers of the United Kingdom. Amongst the chief contributors were Messrs. Boucher (Brighton), V. Blanchard (London), Slingsby (Lincoln), Faulkner (London), and Brightman (Bristol). Amongst the local exhibitors were Messrs. Sachs, Appleton, Passingham, A. Megson, T. Burrow, and H. Rogerson, of Bradford; Mr. E. Greaves, of Halifax; and Messrs. Wormald and Broadhead, of Leeds. An interesting lantern exhibition of continental views, &c., was given during the evening by Messrs. Howarth, Burrow, and Rogerson, which was highly appreciated by the company. Mr. Davis, of Bradford, fitted up a telephone from the meeting-room to a distant part of the premises, and through its medium songs were sung and dialogues carried on with the utmost ease and distinctness. A large quantity of apparatus interesting to professional men was likewise shown. The specimens of artistic work brought together in this exhibition were very interesting, and illustrated in a marked degree the great advance which has been made in photography during the last few years. Portraits were, of course, the chief feature, and of these there was a large number, Mr. Albert Sachs, Messrs. Appleton and Co., Mr. Passingham, and other well-known local names being admirably represented. It is satisfactory to observe that in the matter of pose a very marked improvement has been made; for, let the sun do its work ever so well, unless the photographer is artist enough to know how to manage his figures the result is unfavourable. The specimens of instantaneous portraits of children were capital, and there was a number of exquisitely clear landscape photographs. Altogether the exhibition was an exceedingly good one, and may be taken as representing the photographer's art at its best. Where there was so much that was really artistic and good and painstaking, we will not attempt to draw invidious comparisons.—*Bradford Observer.*

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* This report miscarried in transmission last week.

Correspondence.

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COMPARATIVE TRIALS OF EMULSION PLATES.—BROMIDE OF CAMPHOR. —COLOURED ENAMELS.—FERRO-PRUSSIATE PAPER.—THE FRENCH EXHIBITION.

I HAD the privilege last June to assist as one of the commission in the closing of a wooden box, and to impress my seal thereon. The contents were bromide emulsions, dry and liquid, and plates prepared by the process of M. Alfred Chardon. The plates were inserted in the grooves of the usual white wood plate-boxes. That of M. Audra was enveloped with thin sheets of lead, and was a rather old box, while those of M. Chardon and of M. Davanne were new ones. In that of M. Davanne were also placed two plates of the same preparation, but which had been exposed in the camera but not developed. Each of these gentlemen also furnished emulsion powder in a dry state, those of MM. Audra and Davanne being enclosed in glass bottles, whilst that of M. Chardon was in a round paper box, similar to pill boxes sold by druggists. All these objects were wrapped up in orange-coloured paper, carefully put in the packing-case, and wedged up with paper. A photographic print of the portraits of the members of the commission was placed on the top. The wooden packing-case was then enclosed in zinc, and the cover soldered down to prevent the admission of air or damp. I observed at the time that I did not think the mode of carrying the prepared glasses a good one, having experienced the evil effects of white wood plate-boxes.

By the kindness of M. Audra the case was sent out to Shanghai by the Messageries Nationales. A few days ago the case was returned, and I assisted in its opening. First: a letter from Commandant Champenois to M. Audra was read, by which it appeared that the case had been entrusted to his care and guard, and that it had made the voyage out to China and returned again. The temperature during the whole voyage averaged 30° Centigrade, but during the passage of the Red Sea the heat increased to 40° Centigrade.

We found the outer zinc case intact, and likewise the wooden box with its seals. The silver print at the top of the case was burnt for about half-an-inch all round the edges, corresponding with the soldering of the zinc case, by which it was caused.

Our first examination was connected with the contributions of M. Davanne, and with one of his plates exposed before us in June. M. Davanne supplied the camera, fitted with a Dallmeyer wide-angle rectilinear lens, No. 1, of seven inches equivalent focus and No. 3 stop, which is about $\frac{f}{30}$. All the experiments of the Commission, which date from March, were made with this lens and the same stop. The plate, which had been exposed two minutes in a dull light, was first well washed and rinsed with alcohol at 36° to restore the porosity of the film; then thoroughly well washed with water under the tap until all greasiness had disappeared. The plate was now placed in a tray containing a solution of sesquicarbonate of ammonia, bromide of potassium, and pyrogallic acid. The image began to appear very well; but long before arriving at the necessary vigour the edges of the plate became veiled, the fog spreading inwards during the development, leaving only a circular portion in the middle of the plate where the image was visible pure and clean, having the appearance as if the defect had spread from the edges of the plate which had been in contact with the wood of the plate-box, and had gradually become weaker in the ratio of the distance from the edges of tht negative.

On examination, however, this plate presented a curious phenomenon. It had been the first one placed in the grooves of the plate-box, its back being nearly in contact with the end of the plate-box, the film being inwards. The second plate had, in its turn, its back towards the film of the first. On its top corner a gummed label had been attached, on which was inscribed the date and length of the exposure. Well, upon the film of the first plate, when it was developed, a part was altogether insensible, but having the exact form and shape of the label which had, during the voyage, been in front of it. After fixing it was neither fogged nor showed the least trace of any details of the picture, but was perfectly transparent as clear glass, though all around it was fogged! What was the cause of this? Was it the absorption of the humidity of the label, together with antichlor in the paper thereof, or acidity of the gum on the label?

The second plate was developed, and the result was similar to No. 1; the label attached to the back of this plate had no influence on the film of collodio-bromide on the front side—a fact which might be used as an argument in favour of the absorption theory on the first plate.

The third experiment tried was with one of the prepared glass plates which had made the voyage to China, and was now exposed for two minutes with the same lens and developed, but the negative was not good.

A plate was then prepared and coated with emulsion of the same make as that on the preceding glasses, and the result was perfect.

Two of M. Audra's plates were exposed and developed, and were found in the same condition as No. 1, as likewise two of the plates of M. Chardon, which were no better.

A plate was now collodionised, prepared from the dry emulsion sent out in a bottle, by M. Davanne, in the proportion of four grammes of the powder to one hundred cubic centimetres of ether and alcohol. The negative was everything that could be desired—quite equal to wet collodion—with a rich bloom on its surface, and a film completely homogeneous.

The dry emulsion prepared by M. Audra gave similar exquisite negatives; but the sample enclosed in the small, round paper box by M. Chardon had quite changed its colour to a decided grey, showing that it was decomposed; and, after the solution in ether and alcohol it gave very inferior results.

The liquid emulsions, in comparison with those newly prepared, seemed to have become poorer in body, and gave a film more transparent and an image of less force, although by pouring the solution more slowly on the glass, and, leaving it to form a thicker film than usual, negatives were obtained having printing qualities. No amount of agitation of the bottle seemed to have any effect. M. Audra proposes to try the experiment of re-precipitating and re-dissolving the remaining portion of his collodio-emulsion, to see if he can restore the emulsion to its primitive state of excellence.

All the plates had been passed through a bath of nitric acid, washed, and cleaned, finishing off with the old rubber of wash-leather used for the last polishing of daguerreotype plates. This treatment necessitates the use of a substratum, or of varnishing the edges of the plates before developing.

What are the conclusions to be drawn from the exceptional trial of this voyage to and from China? 1. It is clear that the prepared plates are not safe in the usual plate-boxes. 2. That the emulsions in solution suffered slightly from the tests applied. 3. That the emulsion in powder, protected by glass bottles, was fully as good after the voyage as that freshly prepared, and therefore to be thoroughly recommended for use in that state by foreign missions and travellers in hot climates.

M. Audra will shortly send off some of his collodio-emulsion preparations on a voyage to the North and the East, during which the temperature will vary from below freezing point up to 45° Centigrade of heat, so as to still more seriously test the keeping qualities of collodio-emulsions, both in a dry and liquid state, as well as on prepared plates. Means will be taken to avoid previous errors, and to pack up all in such a way that no contact can take place with any deleterious matter. It is proposed to place the plates, with the films face to face, on the hollow side of each glass, and separated only by a thickness of waxed paper, which may be used also to lap up the plates in packets of ten, and tied up to render them less impervious to air. A ball of wax placed at the corners was proposed; but this would not wholly answer in a warm climate, otherwise it would be good, as there would only be friction at the corners, which would not be a disadvantage, whilst friction along the whole length of the edges of the plates would destroy the binding power of the collodion overlapping the ground edges of the glasses. Perhaps for this reason the use of hard wax and a small corner piece of waxed paper united together would be the proper thing. M. Ferrier, for his own personal use with Taupenôt plates, and to his entire satisfaction, employs a narrow frame of cardboard between each plate; but this for bromide emulsions is objectionable, like the label on the first experiment.

Should any of my readers have a better plan to propose I hope it will be communicated through the pages of THE BRITISH JOURNAL OF PHOTOGRAPHY. Have any of them tried bromide of camphor for emulsion work? MM. Poulenc and Wittmann have prepared this salt for experimental use.

Having occasion to call upon M. Mathieu-Deroche, the photographic enamellist, he showed me an application which pleased me very much. It was the enamel portrait of a lady in an oval, and beautifully coloured after nature. It was attached to the inner case of his watch, the bright burnished gold of the interior of the cases adding to the charming appearance of the picture. This idea is as applicable to ladies' watches as to gentlemen's, and the coloured or plain enamel portraits can be easily secured in the watch, as if framed therein, by any watchmaker or jeweller. Ladies appear to prefer very much this fashion of having the portrait of some one dear to them, and treasure it the more from its being protected, like a "household god," from the vulgar gaze of strangers and the outside world. Some of the admirable portraits of children by that distinguished artist, Mr. Faulkner, treated this way would be charming.

I also admired the *facsimiles* of many old and newly-painted ivory miniatures—some reduced, some enlarged in size, by photographic means, and the colours fixed in the fire. I think this a very delightful use for enamels, and I am sure business might be done were photographers to look after this branch of their art; and the great number of miniatures in England, which have cost pounds to produce, might be multiplied most perfectly for presentation to the different members of a family at a price, comparatively, of so many shillings. These enamels might be made most certainly a mine of wealth to photographers.

That cheap and useful adjunct to the studio and *atelier*, ferro-prussiate paper, is still further to be improved; for M. Pellet has discovered a way of printing the details of architects' and engineers' plans, designs, and writing, directly in blue on a white ground, the paper now made and supplied to the profession printing the subject in white on a blue ground. I hope to be able in my next communication to give all the details of M. Pellet's new preparation and manner of operating.

On dit that, amongst the new books which are in course of preparation M. Liebert is busily occupied on another edition of his work on *Photography,* which will contain many improvments, and be considerably increased in size.

M. Lamy, of stereoscopic fame, is about to give a demonstration of carbon printing at the next meeting of the Photographic Society of France, and of which more anon.

I do not recollect, during the last twenty years, any period when the photographic calling was in a greater state of depression than it is now here at the present time. The political and social horizon is apparently so charged with storm that commerce is nearly at a standstill, so that it is only for the necessities of life that money is to be found; but, thanks to the *décret* relative to admission to the Universal Exhibition of 1878, the photographer may picture in his mind's eye thaf there is "a good time coming" even for him. The admission of the general public is to be by ticket, to be purchased almost anywhere for one franc. The charge for subscribers' cards is fixed at 100 francs, and each person on paying his subscription must give at the same time to the administration two of his or her photographic *cartes de visite,* one of which will be retained for official use, and the other will be returned to the subscriber, with a stamped and numbered receipt pasted on one half of its front and on one half of its reverse side, thus constituting the "*carte d'admission,*" which will be personal, and must be signed by the owner, who will be required to write his signature on entering whenever required so to do. This card not only secures admission at the hours set apart for the public, but also during all the hours specially reserved for study. Persons living out of France in foreign countries can send their applications on and after the 1st of April to the agent at the Ministry of Finance, forwarding (by letter) at the same time two of their *cartes de visite,* accompanied by the necessary amount, and they will receive by post an acknowledgment which, upon presentation on their arrival in Paris, will be exchanged for the subscriber's card. Only one gratuitious card of admission will be given to each exhibitor or to his representative. It must be a signed portrait *carte de visite* as for subscribers, and will be delivered personally.

Similar photographic *cartes* will be necessary even for the superior members of the commission, members of the committee of contracts, all members of the consulting commissions, of the commissariat, the presidents, vice-presidents of each foreign commission, and of all persons delegated by them as commissioners or attached to them on active service, all members of the Paris committees of admission, and all members of the International jury. It is only workmen and guardians who will have a simple *jeton* of service for a limited time, and which will be delivered personally to their employers. Thus it will be seen that French citizens and foreigners are placed upon a footing of perfect equality. A letter of M. Krantz, senator and *commissaire-general,* published today, states that the works of the exhibition are so far advanced and ready that exhibitors have now five months before them to take possession and to complete their labours, which has never been the case in any other international exposition. Under any circumstances the doors of the Palace of Industry and the Fine Arts will be opened, and France give *rendezvouz,* on the 1st of May, 1878, to the people of all nations. Photographers may rub their hands with delight at the harvest assured to them. W. Harrison.

Asnières (Seine), Paris.

AUXILIARY EXPOSURES.

To the Editors.

Gentlemen,—Having read with much interest in your columns the various letters respecting the "Scotellari cap," especially as I am working with them myself, I beg to offer a few remarks.

During the recent photographic exhibition I paid Signor Scotellari a visit at Messrs. Marion and Co's. and saw the demonstration, and must admit that I was not at all satisfied with the result. I promised that, on the following day, I would again see it worked. I there met Mr. Harrison, of the Stereoscopic Company, Regent-street, who very kindly invited me to see it demonstrated at the above studio. Well, I had but little time, so would not decide, certainly thinking it not worth the outlay.

But some days afterwards Messrs. Marion and Co. sent me a set of caps, asking me to give them a fair trial, which I have done. I have taken several hundred negatives with them, and, like Signor Lombardi, I can say that, in my hands, it certainly gives what it professes to do.

I have bought at different times many new inventions; but in this case I was determined not to be "sold." I therefore had them several weeks, have worked them myself as well as my assistant, and I am decidedly of opinion that if Messrs. Marion and Co. were to do to other photographers as they have done to me, namely, send a set on approbation, I venture to say that if a fair trial be given them—especially at this dark season of the year—few would be returned.

I take the liberty of sending you a cabinet portrait of a child, taken last week after three o'clock in the afternoon in fifteen seconds, with the assistance of the Scotellari cap, which I feel certain I could not have been able to take without it.—I am, yours, &c., C. J. Witcomb.

10, *Catherine-street, Salisbury, December* 3, 1877.

[In connection with this subject, and *apropos* of Mr. Currey's communication in last number, we have received a letter from Mr. E. Frank d'Embourg, the gentleman described by Mr. Currey as the interpreter of Signor Scotellari, in which he says that the object photographed on that occasion was a chair, and designates Mr. Currey's statements respecting the development as incorrect. Two plates were exposed, and our correspondent had to request the assistant who developed the latter of them not to confine his attention to the one end only, but to treat both images alike, one being at each end of the plate. There being much matter of an exceedingly personal nature in this letter we do not publish it, so far as it relates to Mr. Currey, but we have no such scruples about the postscript, which is as follows:—"In answer to the lines added by the Editors to Mr. Currey's letter, I invite them to study the question and the principles which the apparatus utilises longer and deeper, and I am sure they will find the same results which have been found by numerous chemical and physical authorities, and by many experienced and honourable members of the profession who practise and employ Signor Scotellari's invention with the greatest benefit, especially in this dull season of the year."——In reply to this:—Will it surprise Mr. Frank d'Embourg to be informed that several years before the "cap" of Signor Scotellari had been heard of, the subject of auxiliary exposures, its principles and its practice, had engaged the attention of several photographers in this country? Will it surprise him to learn that it had been brought under the notice of photographic societies, and had provided a theme for many articles in this Journal by the Editors, of whom the advantages accruing from such treatment have always been recognised? We here, also, acknowledge the receipt of a letter from Mr. William Hellawell, of Market-street, Manchester, who, having been present during Signor Scotellari's visit to Mr. Currey, substantiates the statements made by the last-named gentleman, and narrates what took place when Signor Scotellari was demonstrating in his (Mr. Hellawell's) studio. He, too, speaks of a wager of £40 being offered in his case. But as enough on the mere commercial phase of the application of auxiliary exposures has now been said, we here allow the subject to end.—Eds.]

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Edinburgh Photographic Society.—The annual supper of this Society took place at the Albert Hotel, on Wednesday, the 14th ult. Dr. Sidey, one of the vice-presidents, occupied the chair, and Mr. W. H. Davies officiated as croupier. The attendance was good, and included a larger amount of musical and histrionic talent than usual. The evening was one of the happiest that has yet been spent in connection with the Society.

The Treatment of Air-Bubbles by the Air-Pump.—In the *Archiv* Herr J. N. Pein, of Hamburg, suggests a novel method of preventing air-bubbles in carbon pictures or lichtdrucks. For a long time he was in doubt as to the cause of air-bubbles, but at last he concluded that the minute quantity of air retained between the paper and gelatine expanded by the heat of the developing water, and became rarer and lighter, until at last it raised a blister and so escaped. Acting upon these premises he soldered a border of tin about three-quarters of an inch high, forming a sort of *cuvette,* upon the plate of an air-pump. The diameter of this metal hoop, being rather less than that of the receiver of the air-pump, slipped easily into the interior of the bell and was closed by the latter. When, therefore, Herr Pein had reason to fear air-bubbles he filled the *cuvette* here described with water, and placed it in the glass plate upon which the picture to be developed had already been squeegeed, paper side uppermost. The receiver was then placed over the whole, and air pumped out until what remained became very much rarefied; then the air, which was shut up in the pores of the paper and the gelatine, finding no opposing pressure, excaped, as well as that contained in the water, and the latter rushed in to fill the empty pores, thus rendering the formation of air-bubbles an impossibility. He also uses the same contrivance in preparing a gelatine solution free from air-bubbles for lichtdruck purposes. He then places the pot containing the gelatine solution under the receiver, without filling the *cuvette* with water, and pumps out the air. As soon as air-bubbles cease to be developed he gently pours out the gelatine, and the result is a faultless plate. In order to be sure that the prepared paper does not become insoluble he finds it necessary to maintain a constant stream of cold air, and as a little chlorine gas must always be contained in it he has constructed a special drying-box to obtain that requisite, which he uses with great satisfaction for drying lichtdruck plates as well as carbon tissues.

EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale*, that being done at a small cost in our advertising pages. This portion of our columns is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

For exchange, a square quarter-plate parallel bellows camera, swing back, one single and two double slides, by Lancaster and Sons. Wanted, a Ross 5 × 4 B doublet; difference adjustable.—Address, Major Gubbins, 10, Grove-street, Leamington.

A 1-1 view lens by Dallmeyer and quarter-plate portrait lens by Ross, both perfect, are offered in exchange for No. 5 or 6 triplet by Dallmeyer, or doublet by Ross.—Address, E. Debenham, Ryde.

A Johnson's pantascopic camera, for pictures 12×7 (with clockwork movement), is offered in exchange for a good portable lathe.—Addrsss, J. C. H., 2, St. Germain's Villas, Honor Oak, London, S.E.

◆

ANSWERS TO CORRESPONDENTS.

Photographs Registered—

J. Henderson, Charing Cross.—*Four Portraits of Miss Ethel Western in the Characters of Desdemona and Juliet.*

☞ *Correspondents should never write on both sides of the paper.*

Notice.—Each correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a *nom de plume* as hitherto, or, by preference under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications

G. W. H. B.—We understand that Messrs. Marion and Co. supply the article required.

W. H. J.—It is not only possible, but quite easy, to produce a transparency from a transparency by one operation, using a bromised film and nitric acid.

Rector.—The diagram is incorrectly drawn. The line A E ought to be the axis of the system. If you send us your present address the diagram will be corrected and returned.

E. Frank d'Embourg.—Unless the letter were re-written it could not be published *in extenso*. It might subject our Publisher to an action for libel if printed without alteration.

S. E. M.—The failure was caused by your having made use of water of a temperature of 100° Fahr. instead of 100° Centigrade. This distinction was clearly pointed out in the article.

J. S.—Ammonia is a "rough and ready" test by which to determine whether a film be an iodised or a bromised one. If it be the latter the ammonia will dissolve out the bromide, leaving it clear; an iodide film remains unaffected by such treatment.

X. Y. Z.—Black spots in paper prints cannot be said to reflect any special discredit upon the operator, because in the great majority of instances they are caused by minute particles of metal in the paper, introduced while the paper was in the state of pulp.

Eburneum.—There is no restriction upon practising the eburneum process. Your misconception may possibly arise from the fact that it was at one time practised as a secret process. It was, however, soon divulged, after which it became public property.

E. A. Clay.—We do not quite understand your question. There can be no comparison between a "light" and an "enlarging apparatus." The light you mentioned is, however, quite suitable to be employed in connection with an enlarging camera, if this be what you mean.

W. Hellawell (Manchester).—Our correspondent encloses a charming *carte* portrait of a child taken with an exposure of two seconds, during the past month. There was no "auxiliary exposure" given in this case. Such a degree of rapidity he attributes to the use of acetate of iron in the developer.

"Night Photography."—In reply to some correspondents, we have to state that the process of photographing at night by means of the electric light, as practised in the "Vanderweyde light studio," in Regent-street, is undoubtedly successful. We have been present and have seen it in active operation. We shall probably have something to say concerning it in our uext issue.

S. W. Gardner.—It is probable that by diluting the bath with distilled water, so as to cause a precipitation of some of the iodide now in solution, the evil might be remedied. It will be necessary to filter the bath to remove this iodide, and then make up to a strength of thirty-five grains to the ounce by adding a few crystals of the nitrate. Previous to subjecting it to treatment of any kind ascertain if its strength be not too great.

R. C. Littler.—Seeing that the films refuse to become detached from the plates by immersion in water, add to the water some sulphuric acid, commencing with a few drops, which may be very much increased. A large proportion of this acid does not injuriously affect the negative; but it has such an effect upon the collodion film itself as to cause it to lose its attachment for the glass, and, in consequence, it will be very soon be found to be floating in the liquid.

John Vaughan (Oxford) desires publicly to thank Mr. Inskipp for the very interesting letter in our issue of the 16th ult., written in reply to his (Mr. Vaughan's) request. Circumstances of a peculiar nature prevented him from making this acknowledgment earlier. We have also received other letters expressing a sense of obligation to Mr. Inskipp.

J. D. Nichols.—Seeing that the strength of the developer is given at fifteen grains of photosulphate of iron to the ounce of water, and that this was stated to be a proportion that ought to be adhered to as nearly as possible, it is scarcely reasonable to complain of a want of success when, as you state, you have substituted ammonio-sulphate of iron for the salt recommended. To have had a developer possessing an equal degree of power with that mentioned above, a much larger proportion of the double salt would require to have been used.

H. P.—The intensity of the negative may be reduced in the following manner:—First of all remove the varnish by the process we have frequently published and recommended; then apply a solution of chloride of gold, by which a process of conversion is effected. Now, after rinsing, pour on a little nitric acid, by which the picture will be *apparently* removed, although on a careful examination it will be seen to be still existing. This feeble image is now strengthened by acid pyro. and silver, taking care not to carry the intensification too far.

H. M. (Amateur).—We shall give a general answer to your queries, instead of replying to them in detail. To convert chloride of silver (such chloride as you have) into nitrate, employing metallic silver as the medium, proceed as follows:—Into the chloride, which must be brought to a thin, pasty condition with water, pour a few drops of sulphuric acid and stir together. Now immerse a slip of zinc and allow it to remain for a few hours, or until the conversion of the chloride into the metal has been effected. Next wash this metallic powder thoroughly by giving it several changes of water, and then, having treated it with distilled water, add nitric acid, with the addition of a little heat, by which the whole will be rapidly dissolved. Oxide of silver may be formed by adding a solution of caustic potash to a solution of nitrate of silver. This should be washed, and for your purpose it should be retained in a moist state by the presence of water.

Erratum.—In Lieutenant Lysaght's communication at page 570, in the last line but one, for "hollows" *read* "bellows."

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Photographic Society of Great Britain.—The next meeting of this Society will be held on Tuesday next, the 11th inst., at the Water Colour Gallery, 5, Pall Mall East, at Eight p.m. The discussion on *Emulsions* will be resumed, in which Captain Abney, R.E., F.R.S., and Mr. Herbert B. Berkeley are expected to take part. Members have the privilege of introducing a friend.

West Riding of Yorkshire Photographic Society.—The next ordinary meeting of this Society will be held on Monday next, the 10th instant, at the Odd-Fellows' Hall, Thornton Road, Bradford, at 7.30 p.m., when a communication from Mr. Gregson, Blackpool, on *Secret Processes*, is expected to be read. Several alterations in the rules will be proposed and discussed, and other matters of importance brought before the members.

◆

LONDON GAZETTE, *Friday, November* 30, 1877.

Petition for Liquidation by Arrangement.

B. Kelly, Lincoln, photographer.

◆

OUR ALMANAC.—Our business friends who have not yet sent in their Advertisements are requested to do so before Monday, the 17th inst., up to which time a few more pages of Advertisements will be received.

◆

METEOROLOGICAL REPORT.

Observations taken at 406 Strand, by J. H. Steward, Optician

For the Week, ending December 5, 1877.

These Observations are Taken at8.30 a.m.

Nov.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks
29	28·83	SW	47	49	50	39	Raining
30	29.05	W	42	43	48	40	Cloudy
Dec.							
1	29·21	W	43	44	49	41	Raining
3	30·19	E	45	46	49	41	Cloudy
4	30·01	NE	44	45	47	43	Cloudy
5	30·00	N	42	44	—	41	Cloudy

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THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 919. Vol. XXIV.—DECEMBER 14, 1877.

VOLUMETRIC TEST SOLUTIONS FOR USE IN PHOTOGRAPHY.

In order to complete the purpose of our article in last week's issue, we have now to describe the mode of using the alkalimeter and the preparation of the test solutions for various purposes. We may, however, first add a few words to what we have already said regarding the appliances. We spoke last week of an instrument capable of containing one thousand grain-measures and divided into one hundred parts; but it is obvious that any other capacity or number of divisions may be adopted if preferred, though for various reasons those mentioned are most generally useful. It is a matter of taste or convenience whether the capacity be 1,000, 500, or 250 grains, but whichever be selected it is desirable that the graduations be made in degrees of ten-grain measures in order that confusion may be avoided in preparing the test solutions. The solutions we shall give in the course of the present article may be used with instruments of either of the above capacities, provided they be divided into one hundred, fifty, or twenty-five degrees respectively.

For very delicate operations it will perhaps be convenient to use a smaller instrument made of tubing of less diameter, so as to increase the length of the degrees and render very accurate readings possible. Such an instrument of one hundred grains' capacity may be constructed out of tubing about the thickness of an ordinary lead pencil, and will be about seven inches in length; it may be fitted with an india-rubber cap or "teat," and is filled and used in the same manner as the dropping-tubes in ordinary use. Only the ten-grain degrees should be marked on the tube, the sub-divisions being "read off" with the assistance of a separate scale marked upon a strip of ivory or brass. In this manner it is possible to read off accurately to the one-hundredth part of the total contents of the pipette. We employ a similar loose scale divided into fifths for reading off fractional parts of the degrees upon the larger instrument, and find it extremely useful. A second pipette to draw off measured quantities of liquid to be tested will be found a further assistance. One or two fluid drachms capacity will be quite sufficient; but it must be borne in mind in marking the tube that the *weight* of the fluid drachm of distilled water is 54·7 grains at 62° and 56·95 at 60° Fahr., and not 60 grains, as many suppose.

It will be observed that we have made no allusion to temperature as affecting the results obtained with these instruments. We have made this omission purposely in order not to complicate matters too much, believing that for the purpose of testing baths, for which they will be mainly used, the variations in the ordinary temperature of the studio or laboratory will not introduce so much inaccuracy as already exists with the means now usually adopted. For the more delicate operations it is needless to say that one uniform temperature should be adhered to in order to secure results of any value; but we imagine it is only necessary on our part to point out the danger in order to secure its avoidance. From the figures we have quoted in connection with the weight of a fluid drachm of distilled water it will be seen that so slight a variation as two degrees of temperature causes a difference of more than four per cent. in the weight. If ocular demonstration be desired of the effect of temperature upon the expansion of liquids, let a piece of "quill" tubing twenty or thirty inches in length be filled three parts full of cold water, one end being closed. Place it in a perpendicular position and mark the height of the water upon the tube; if it be now grasped in the lower part with the warm hand the water will be found to rise noticeably higher, and if dipped into hot water for a few seconds the increase in height will be as much as an inch or two. Our readers, then, in graduating their tubes, as well as in weighing out the quantities of water to make the test solutions, will bear in mind the question of temperature.

The first and most common use to which the alkalimeter will be applied by photographers is the determination of silver nitrate in negative or printing baths or in other solutions. For this purpose a solution of chloride of sodium is employed as being at once the cheapest and most stable salt for the purpose. A standard solution may be kept ready for use; it is made as follows:—

Dried chloride of sodium.....................	241 grains.
Distilled water (by weight)	1 lb. avoirdupois.

The salt must be dried perfectly, and the water weighed into a counterpoised vessel in, we need scarcely say, an accurate scale. The pound avoirdupois is not only the readiest weight for the purpose, but consisting, as it does, of 7,000 grains it is specially suited to the necessary calculations; the above quantity of solution will fill seven times the largest-sized tube we have mentioned, and it may be used with any of them, each degree (of ten grain-measures) being equivalent to one grain of silver nitrate. The quantity of salt is, therefore, supposed to be equivalent to 700 grains of silver, but is, in fact, a little more than one-tenth of a grain in excess of the exact quantity; the error is so slight, however, as to amount to less than half-a-grain in estimating 1,000 grains of silver, supposing the conditions to be such as to secure perfect accuracy in other respects.

In order to determine the quantity of silver contained in a solution, draw off by means of the measuring pipette one fluid drachm, and add one drop of dilute nitric acid, though this is not absolutely necessary. If the quantity of silver be known approximately drop in from the *burette* (previously filled to a known mark) about three-fourths of the quantity of solution estimated to be required; stir well and proceed to make further additions, a few drops at a time, until a precipitate ceases to be formed. If the strength of the solution be entirely unknown, proceed with caution from the commencement. The precipitation being complete, read off the number of degrees of solution used, and, by means of the loose scale, the odd fraction, if any. Let us suppose the quantity to be four degrees and one-fifth; this represents 4⅕ grains of silver in each drachm of solution, or, multiplying by 8, 33⅗ grains in each ounce. This will be found sufficiently accurate for general purposes, but it may vary a tenth of a grain in the quantity tested; thus, if the solution were really 33½ grains to the ounce, the nearest approach we could make to truth under the conditions described would be to fix it at the strength stated above. By employing a measuring pipette constructed to draw off one-fifth of an ounce (or 87½ grains measures) a nearer approach to accuracy could be made, as both the salt to be tested and the volumetric solution would then be measured in fifths of a grain.

When extreme accuracy is required, or where the quantity to be operated upon is only small, as in estimating the quantity of free silver in emulsion, it is better to employ the iodide of starch solution, which presents the extra advantage of affording a colour test, which marks when the reaction is complete. Triturate in a mortar thirty grains of starch and fifteen grains of iodine with a little water until they form a smooth paste; add three ounces of boiling water and stir the whole well together, keeping it *just* at boiling point for two or three minutes. When cold the quantity is made up to 2,000 grain measures; or, as the solution would then include a slight error, make it up to 1,900 grains, and after testing it with solution of silver nitrate bring it down to such a strength that 100 grain-measures are equivalent to one grain of silver nitrate. This, though more troublesome in preparation, is a much more delicate test than the preceding; it may be used with the 100-grain graduated pipette. One fluid drachm of the emulsion to be tested is precipitated in a small quantity of water in a glass flask and raised to boiling point. *When cold* the test solution is dropped in until it ceases to be decolourised; as soon as the solution in the flask acquires a permanent blue tinge the reaction is complete. It is important that it be allowed to cool before applying the test, as the deep blue colour disappears when heated, but returns when it is allowed to cool.

For testing the quantity of free haloid in emulsion we employ a solution of seventy grains of silver nitrate in one pound avoirdupois of distilled water, one hundred grain-measures of which contain one grain of the silver salt. It is impossible to discriminate between the different haloid salts which may be present in excess; but the result gained with the solution is the quantity of silver which would be required to exactly neutralise the emulsion. The one-hundred-grain pipette is employed, and greater care and observation are necessary than in the last test, owing to the absence of colour.

The last application of the alkalimeter for testing purposes which we shall notice is its use in determining the purity and combining equivalents of samples of bromides and iodides, for which purpose the same solution of silver nitrate is employed. We cannot do better than describe one or two actual experiments to show the utility of this application, and also to point to the importance of thus examining the salts employed. Five grains of carefully-dried ammonium bromide were dissolved in a few drops of distilled water, and treated with the test solution, of which 867½ grain measures were used (86¾ degrees of the alkalimeter). This quantity represents 8·675 grains of silver nitrate, and if we make a rule-of-three sum of it we find it gives the equivalent of the salt as a small fraction under 98, thus— 8·675 : 5 : : 170 : 97·9827.
We know that the equivalent cannot be less than 98, though it *might* be higher, but the error which we may set down to "careless manipulation" would amount to less than one grain in 32 *pints* of emulsion, each ounce of which contained sufficient ammonium bromide to decompose five grains of silver nitrate. It proves at least the stable nature of the salt if carefully dried.

Two samples of cadmium bromide treated in the same way, required respectively 62½ and 54⅕ degrees of the alkalimeter, corresponding with the equivalents 136 and 156·8. The latter was a sample recently purchased from a retail chemist, and the result shows how thoroughly all calculations must be upset by the employment of "crystallised" bromide of cadmium. The other result was obtained with a portion of the same sample after it had been fused in a porcelain capsule, and shows that a really anhydrous salt may be obtained—a fact which we had previously doubted.

In conclusion: we have by no means exhausted the list of useful applications of the alkalimeter in the hands of photographers, but we have given those which appear to us most obvious. It must not be supposed that the instrument, however carefully and accurately constructed, will do all the work; on the contrary, there is a fair share left to the operator, and many, no doubt, will be surprised to find that even with perfect appliances it is not the easiest matter in the world to determine the strength of a silver bath to within a grain of the truth, much less to estimate from a single drachm of emulsion the exact fraction of a grain of silver nitrate requisite to render it neutral.

NOCTURNAL PHOTOGRAPHY.

It will be remembered that at the beginning of the present year we gave a description of an apparatus for aiding in the production of photographs by artificial light, for which a patent had been obtained by Mr. Vanderweyde. Within the past few weeks a large establishment, fitted up in a costly and elegant style, has been opened in Regent-street for the purpose of working the new Vanderweyde light, under the personal superintendence of Mr. Vanderweyde himself. Responding to an invitation to call and see the new studio and its appliances in active operation any evening between eight o'clock and midnight, we called at nine o'clock a few evenings ago, and had our portrait taken under circumstances which we shall explain.

In the first place, daylight has no part whatever to perform in the new studio. The illuminating agent is the electric light, which is obtained from a Siemens' magnetic battery placed in a cellar, and driven by a gas engine of a few horse power. This engine is constructed in such a manner as to be under the control of the photographic operator upstairs on the first floor, where the studio, reception, and dressing rooms are situated. The studio chair—or operating chair, as some persons irreverently designate it—is placed upon a small circular platform, which, however, is not raised any considerable distance from the floor. This platform is capable of being revolved by a push from the foot, so that after posing the sitter, the photographer is thus enabled to effect any change of position with regard to the relation of the sitter to the camera.

After the sitter is posed (which is done by the ordinary gas light in the apartment) he is made sensible of the existence of a large annular lens of a peculiar appearance immediately in front of him—in fact, between him and the camera—although at such an elevated range as not to hide the sitter from the lens of the camera. This annular lens, which is of about forty inches in diameter, is composed of prismatic concentric rings of glass similar to that employed in lighthouses. It is backed by a truncated chamber, the interior of which is painted a pure dead white. The carbon points of the electric light are placed inside of this chamber and just behind the centre of the annular lens. The great point in connection with the lighting system is this—that care is taken to prevent any of the direct light from the carbon points falling upon the sitter, its function being confined to the illumination of the white interior of the case behind the annular lens, the form of the chamber being somewhat similar to that of a parabolic reflector. When everything is ready, and the plate placed in the camera, the operator turns on the light, by which the fierce beams emanating from the carbon points convert the whole interior of the chamber behind the lens into the semblance of an intensely-luminous white cloud, and it is the light from this cloud-like mass which is condensed upon the sitter.

On reflection it will be obvious that any effect in lighting obtained in a well-constructed daylight studio can also be secured from the light we have now described, with the further advantage in favour of the latter that there is a peculiar kind of concentration, so to speak, of the light by which modelling of a singularly perfect character is secured, giving those effects of roundness which are usually only obtained by a system of elaborate retouching of the negative. As the lighting system can be moved and adjusted at will by the photographer, there is no limit to the variety of effects to be produced.

The power of the light, also, is great. When we sat two negatives were taken, and these received exposures respectively of nine and ten seconds each, a subsequent examination of these negatives proving that the exposure was properly timed. Such, indeed, is the rapidity with which pictures can be produced, that it was with no surprise we learned that on the evening immediately preceding our visit no fewer than thirty-four negatives had been taken between the hours of nine and eleven o'clock at night; and on one occasion a lady of whom was taken a negative when *en route* to the opera, had a proof of the same presented to her while in her box—a feat which will be understood when we explain that the electric light may be used for printing as well as for taking negatives.

The quality of the portraits thus produced is indeed admirable· While we write we have before us several specimens by Mr. Vanderweyde's process which leave nothing to be desired. Although they *appear* to owe their quality to retouching we know that such is not the case, for they are all printed from untouched negatives, which are in our possession, and may be seen by those interested in these matters.

Several attempts were formerly made to take portraits by artificial light, but in this one alone matters appears to have been reduced to such a system as to render the results thoroughly artistic and successful.

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ACETIC ACID.

One of our readers submitted to our examination, a short time ago, a sample of this acid possessing certain qualities of so objectionable a nature that he was inclined to reject the whole of the rather large quantity he had laid in stock. He had met with a little irregularity in development, which he had attributed to some accidental cause, and had not investigated further till he gradually became aware that the atmosphere of his dark room was more irritating than usual. Before looking further into the matter he found that a peculiar acrid odour arose during the development, his operator informing him that it was the "iron." He then discovered it was caused by a new sample of glacial acetic acid he had been supplying himself with.

The sense of smell alone was quite sufficient to make us aware that the small sample brought to us was very impure. A very elementary test revealed the existence of large quantities of sulphurous acid, which was all that was necessary to account for the pungent and irritating fumes complained of.

Deeming that the case would not be an isolated one we call attention to it, and will give a few simple methods of examining this important chemical to ascertain its freedom from impurity, after giving our readers some idea of its properties and preparation, some modes of which will easily explain the presence of certain impurities.

Crude acetic acid is obtained in company with wood naphtha, &c., in the distillation of wood, and is contaminated with a large amount of empyreumatic matter, which render it entirely useless till they are removed by some means or other. The processes adopted are very numerous, and upon the particular one selected depends the greater or less purity of the final product. They have one feature in common—in that the acid in one stage of its purification is neutralised with an alkali, and the resulting salt afterwards crystallised and the acid driven out again by a mineral acid, either directly or after the production by double composition of another acetic salt. A common method is to neutralise with lime, heat strongly to drive off impurities and to concentrate; next to decompose by the addition of Glauber's salts—sulphate of soda—which leaves acetate of soda in solution, precipitating the sulphate of lime produced. This acetate is finally decomposed by the addition of either hydrochloric or sulphuric acid, which drives off the acetic acid in a concentrated form, and this product is either sold as produced, or is again rectified, often with manganese or red lead, so as to obtain the purest possible result. It is quite evident that when sulphuric acid is made use of it is very probable that the resulting acid will be contaminated with sulphur in some form, from the decomposition of the sulphuric acid by the resins, charcoal, &c., formed during the fusion of the acetate, and we have reason to believe that the glacial acetic acid to be found in the market is frequently not rectified again after its first production as described.

The chief impurities found in this acid are sulphurous acid produced in the manner we have mentioned—sulphuric acid and sulphates, hydrochloric acid, and sometimes traces of metals. The latter can be detected by sulphuretted hydrogen, which would produce a dark colouration in their presence.

Hydrochloric acid would be discovered by nitrate of silver, the familiar white chloride resulting in its presence, while the existence of sulphuric acid in the sample would be shown by a white precipitate when chloride of barium was added.

Sulphurous acid may be tested for by adding a few scraps of zinc and a little hydrochloric acid, and then putting a slip of acetate of lead paper in the issuing gas; if the acid were present the paper would blacken.

It is to be observed that most of these substances are to be looked at—not in the light of adulterations, but rather as impurities accidentally introduced in the course of manufacture, and imperfectly eliminated afterwards, though it has been stated that sulphurous acid has been employed as an adulterant to raise the freezing point of the glacial acid, and so give a factitious appearance of strength.

We have frequently dwelt upon the necessity for exactness in all operations in photography, and particularly in experimenting, in order that a proper statement could be made of the conditions governing the result, but this it is impossible to do with chemicals of uncertain strength or purity; and, even assuming the purity, there is not a chemical in the whole range of those we employ whose composition and strength is so uncertain as that of the glacial acetic acid. This is owing to one or two chief causes. In the first place, the specific gravity is practically of no use to indicate the strength; and, secondly, there is no definite compound of anhydrous acid and water which can be taken as a standard—referring, for instance, to a constant boiling point. It had been supposed that a definite hydrate did exist, but this view has been conclusively shown by Professor Roscoe and others to be entirely incorrect.

With regard to the specific gravity: it is true that it has a certain reciprocity with the strength; but it is not of an available nature for commercial purposes, and as it is a little singular we here make a note of it. A table of densities and strengths was made by Mohr some years ago; but more lately Oudemans has constructed another, which, however, is not very dissimilar in its leading points, though he states that Mohr's experiments must have been made not with a pure glacial acid, but with one containing five per cent. of water. Beginning with a liquid containing one per cent. of glacial acetic acid, and having at 15° Centigrade a specific gravity of ·9992, each increment of acid shows an increase in the specific gravity, till at seventy-seven per cent. a gravity of 1·0748 is obtained. For an increment of four per cent. beyond this no change is to be noted in the specific gravity; but, when eighty-one per cent. is reached, strange to say, the specific gravity begins now to rapidly diminish, till at ninety-nine per cent. it is 1·0580, and at one hundred per cent. it is 1·0553—the same density it possesses when only forty-two per cent. in strength.

A similar peculiarity attends the freezing point of this acid. At eighty-seven per cent. its freezing point is just below that of water, but it gradually rises as the strength increases in a very regular manner. As this test is the one usually adopted we give a detailed table:—

100 parts by weight of acetic acid mixed with	100 parts by weight of the mixture contain	Temperature of Solidification.
0·0 water	0·0 water	16·7 C.
0·5 ,,	0·497 ,,	15·65 ,,
1·0 ,,	0·990 ,,	14·8 ,,
1·5 ,,	1·477 ,,	14·0 ,,
2·0 ,,	1·961 ,,	13·25 ,,
3·0 ,,	2·912 ,,	11·95 ,,
4·0 ,,	3·846 ,,	10·5 ,,
5·0 ,,	4·761 ,,	9·4 ,,
6·0 ,,	5·660 ,,	8·2 ,,
7·0 ,,	6·542 ,,	7·1 ,,
8·0 ,,	7·407 ,,	6·25 ,,
9·0 ,,	8·257 ,,	5·3 ,,
10·0 ,,	9·090 ,,	4·3 ,,
11·0 ,,	9·910 ,,	3·6 ,,
12·0 ,,	10·774 ,,	2·7 ,,
15·0 ,,	13·043 ,,	0·2 ,,
18·0 ,,	15·324 ,,	2·6 ,,
21·0 ,,	17·355 ,,	5·1 ,,
24·0 ,,	19·354 ,,	7·4 ,,

With a sample previously ascertained to be pure this table may be relied upon to one-tenth per cent.; and, as the temperature of solidification and the melting point are identical in glacial acetic acid, all that is required to test the strength is to cool a sample of the acid by placing a thin test tube of it in very cold water, and then throwing in a small crystal of glacial acid, and shaking; the whole will then solidify. Upon re-melting, a thermometer can be introduced before the whole is liquefied, and the temperature, which will remain stationary till all the crystals are dissolved, can be taken with a small thermometer. A crystal of the glacial acetic acid can easily be obtained by putting a few drops of liquid acid in a thin test tube, and placing it in some dissolving hypo. When exact experiments are undertaken with glacial acetic acid it is well to bear in mind that when the bottleful is frozen the whole should be melted before taking any portion out, as the first portions liquefied contain a greater proportion of water.

We conclnde our notice of this chemical—alike one of the most singular and useful we employ—by referring to the commercial acids not glacial. They are to be obtained in a state of considerable purity, and, except that they are so much more bulky, may be used advantageously from an economical point of view. For example: the glacial acid costs perhaps six or seven times as much as the commercial acid, but is only about three times as strong. The best known acid of these weak kinds is that known by its maker's name, "Beaufoy's," and is generally recognised for its purity and uniformity; it is a little stronger and also dearer than the usual kinds.

We need scarcely say that the actual fact of an acid freezing is of no advantage whatever beyond indicating its strength; hence an acid freezing at 32° F. is as good as one freezing at 50° F. (these being the usual modes of stating the strengths in the dealers' lists), and there is thus a difference of about twelve per cent. in strength, while the price varies perhaps forty per cent. We feel ourselves justified in calling attention to the commercial aspect of the subject, owing to the very common misunderstanding that the freezing properties of the glacial acetic acid confer some especial excellence of quality upon the acid.

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Our readers will join us in welcoming back to our columns Mr. M. Carey Lea, whose article upon the *Colour of Films by Transmitted Light* in our present issue contains some curious facts connected with the colour of light transmitted through semi-opaque films. We may give another instance in which a thin film composed of minute particles of opaque matter exhibits some peculiarity as regards transmitted colour. If any volatile matter be allowed to condense upon a piece of clean glass it will be found that the denser parts show a distinctly different colour from those where the film of deposited matter is thinner. Thus, if a few grains of bromide of ammonium be heated in a hard glass tube, and the vapour allowed to condense upon a piece of clean glass, a semi-opaque spot will be formed. If this be viewed by transmitted light, the centre or most opaque portion will be a greyish-violet colour, while, as the film of sublimed bromide becomes thinner towards the edge, the colour gradually chenges to orange. Other volatile salts no doubt will produce a similar result, but the point to which we call especial attention is this—that though by reflected light the deposit is perfectly uniform, by transmitted light it exhibits a gradation of tints. In the case of an emulsion film submitted to friction we have supposed the change of colour to be due to a reduction to a finer state of division of the particles of bromide, but the explanation will not hold good with the deposit of volatilised matter where the range of tints appears to depend upon the comparative *transparency* of the film. Yet, if an emulsion which gives a violet-coloured film by transmitted light be diluted with ether in order to render it more transparent, the colour remains unaltered. Why this physical difference should exist we cannot yet explain, but we think that the elucidation of some of the obscure points connected with the *colour* of emulsions will lead to an improvement in their working powers.

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COLOUR OF FILMS BY TRANSMITTED LIGHT.

In a recent number of The British Journal of Photography the Editors, in speaking of the various shades of colour exhibited by emulsion films when held up to the light, mentioned that a grey film, by simply rubbing with the finger, acquired the well-known cream colour. This fact may, I think, be easily explained, and without the necessity of supposing the production of any molecular change in the silver haloid.

Some years ago I made a number of experiments upon the light transmitted through media not quite transparent, the results of which experiments were published in the *American Journal of Science.* One of the most striking of these experiments was the following, which evidently bears a near relation to the observation before referred to:—A small mirror about 6 × 8 was laid flat on a table in the sunlight, throwing a bright reflection upon the ceiling. If the ceiling is white, the atmosphere clear, and the mirror colourless, the light spot on the ceiling will be perfectly white. A piece of finely-greyed glass, such as is used in the best cameras, was laid on the mirror, The spot on the ceiling was now no longer white but yellow, or, even with some pieces of glass, orange coloured. As the glass used was perfectly colourless, and differed from an ordinary pane of glass only in having the surface slightly abraded, this production of colour is very curious. It is an effect of interference; the rays which pass through the fine scratches interfere with those which pass through the unaltered glass. If such a piece of greyed glass be taken in the hand and held up to the light, so that a distant white object well illuminated is seen through it, the same effect, though to a less degree, is produced. A white window-shutter across the street, and in the sunlight, acquires a distinct yellowish shade. The effect is less, because in the mirror experiment the light passes *twice* through the glass, doubling the intensity, and also because on the ceiling the bright spot contrasts with the less-illuminated surroundings, and also the colour contrasts with the white which borders it.

Translucent and nearly transparent films were found to give similar effects. A thin coat of milk allowed to dry on glass shows it very well, and also fine precipitates in collodion, produced by dissolving in two portions of collodion two substances which precipitate each other, and then mixing.

It further suggested itself that, if the above explanation was the true one, opaque particles of any colour, even blue, ought to produce this yellow colour, and experiment proved this to be the fact. An insoluble blue copper salt was precipitated in collodion in the manner just mentioned, and glass was coated with it. Such a piece of glass being laid on the mirror, the spot on the ceiling acquired an unmistakable yellow colour.

It seems, therefore, altogether probable that the colour of emulsion films depends upon the fineness of the particles. A film which simply appears grey is comparable to the coarsely-ground glass which does not show any colour (though, probably, in all cases traces of yellow are produced, but too much diluted with white light to be observable). A finer-grained emulsion shows a distincter yellowish shade, and so on, through different degrees. In my experiment with translucent films I never saw the colour advance further towards the more refrangible end of the spectrum than orange or orange-red, and the same has been the case with my experiments with photographic emulsions. But many years ago, in working with the honey-glycerine process, I have seen different parts of the negatives assume all the colours of the spectrum. The red shades were the commonest. Wherever the film was much over-exposed the colour was full blood-red; but also at times I obtained clear blue, green, and purple.

M. Carey Lea.

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THE COMPARATIVE MERITS OF DIFFERENT DRY-PLATE PROCESSES.

[A communication to the Edinburgh Photographic Society.]

Having on more than one occasion called the attention of the Society to the probable advantage of submitting photographic prints for the inspection and opinion of our members, and conceiving this to be a most likely way of conveying much information the result of experience, I have great pleasure tonight in taking the initiative, along with Messrs. Muir, Panton, Murray, and Matheson, by submitting a few of our prints for this purpose.

Before doing so, however, permit me to state more particularly the object I have in view in this project, and the manner of going about it. Although we have frequently had very good papers on special topics connected with photography proper from several of our members, yet there are many who from diffidence cannot be prevailed upon to write a paper, but might, by the exhibition of their work, contribute the result of much valuable experience. Besides, it is not always the best work which promotes most knowledge; we perhaps, after all, learn more by our errors than by our successes. There is much apparent good work which is not the issue of good direction, but the result of a happy circumstance; and this being common in the experience of photography, it is a good thing to know the reason—the why and the wherefore—of such results. Now the object of bringing out the minds of our members on these things surely is worthy of our pursuit.

I have no fears of the willingness of our amateur members to submit their works for this end; but it is probable that some of our professional members may at first be shy in the matter, fearing it may be detrimental to their reputation. But I am convinced that if there be any person to profit most by such proceedings it is the professional man. There are many very intelligent men amongst them who might do not a little good in helping others, especially beginners, out of many prevailing errors, and thus raise their own practice and that of the whole profession to a much higher platform than it has at present, more especially in its relation to fine art.

If such a proposal meet with the concurrence of the Society I would, in the first place, have the management committed to the Council, whose duty it would be to secure the names of members willing to submit their works for criticism or otherwise, and also appoint the special evenings to be set apart for such a purpose. We cannot at first positively predict how such a project may operate; but I would suggest, in the meantime, that such meetings be held once a quarter, which would not be too frequent to affect the time of the Society for other duties.

I would not have it binding that we confine ourselves to the works of our members; but, considering the object we have in view—the increase of knowledge—I would by all means encourage any member to submit for our benefit any work which he may suppose contains something illustrative of a good quality, either in the science or art departments of photography.

On works being brought to the meeting they should be unpacked immediately, and handed round for inspection. After the ordinary preliminary business has been gone through the first individual work should be taken up by the President, who would call upon the author or contributor of the work to make some explanation of the subject, and the special points on which he submits it for opinion. Other members might then be called upon for their criticisms until the subject is seemingly exhausted, when the next subjects, if any, should be treated in a similar manner.

As to the spirit in which opinion should be expressed I think there is hardly any need to say a word. Although we may anticipate diversity of mind on several topics, yet I am sure that every member, whether professional or amateur, will carefully avoid all personalities or any severe criticism tending to wound and not profit. Let us endeavour to have a strict regard to principles connected with the subject on hand and the strengthening of good feeling amongst us, for the sake of our Society.

In conformity with the foregoing plan I now make my explanation as to what I submit at present. I ask your opinion on different dry-plate processes, and desire you to weigh their comparative merits.

With the exception of one or two impressions at the beginning of the scrap-book which I have laid on the table, most of the impressions were taken from negatives made during last vacation. They consist chiefly of collodio-albumen, collodion emulsion, and gelatine emulsion. All the impressions are distinguished by notes at the side of each, mentioning the process and the length of time in exposure. I cannot take up your time by dwelling on them individually. With the exception of one or two impressions from negatives taken before the years 1851 and 1855, all the rest are first impressions (proofs, as it were); they have no treatment whatever in sky, &c., and, being so, I think they are the more valuable for our present purpose, many of the impressions indicating the useful experience of either over- or under-exposure.

Before I went to the country I received a very kind letter from Mr. Wardley, of Manchester, whose work in collodio-albumen gave us so much pleasure in our late photographic exhibition. Through the direction of his letter I made several attempts, which I cannot say were without some profit; yet I must confess that, with the exception of one or two negatives, I did not succeed at all as I had hoped. But I must not blame the process. I was labouring hard to restore some old collodion by mixing it with some which was new, and though there was an improvement I fear that this combination was the chief cause of my failure. I cannot say that (on this occasion) I ever succeeded in producing a negative without blistering during development—a too common complaint, I fear, in the experience of many with this process. An impression from my best negative by this process is now on the table.

The next dry-plate process which I tried was a collodion washed emulsion made by Mr. Turnbull, one of our members. With this I had no difficulty, and I seldom worked with any process in which I could do so with greater certainty. Its only drawback was the extreme length of time in exposure which it requires, necessitating at least twenty minutes under ordinary good light. I need not describe its characteristics in action and results; the impression now before you speaks for itself. Besides, the process is already well known to several of our members, some of whom have produced beautiful results, and specimens will be submitted tonight by our esteemed Treasurer, Mr. Matheson.

I next tried an additional sensitising solution, applicable to any emulsion, by way of lessening the time of exposure. On applying this to Mr. Turnbull's emulsion I found, to my agreeable surprise, that the time was reduced fully one-half. My information regarding this application was derived from the proceedings of an American photographic society, in which Mr. T. C. Roche made the following remarks, which will be found in THE BRITISH JOURNAL OF PHOTOGRAPHY, July 6th, 1877:—

> "Mr. T. C. Roche said that any good emulsion could be made to work more rapidly by first washing the coated plate thoroughly with water, and then flowing over it a solution of alkaline albumenate of silver before exposure. The solution was made by using the white of one egg, two ounces of water, and a few drops of aqua ammonia. To this was added enough of a thirty-grain solution of nitrate of silver to make the mixture milky. Then add ammonia again until the solution become clear. A few drops would be found quite sufficient to accomplish that. Before development the plate should be well washed, and a ten-grain solution of bromide of potassium flowed over; then wash and flow on the pyro. The picture would show up quickly. Now add a few drops of ammonia and bromide of potassium solution to the pyro., and complete the development."

I regret that the impressions from my negatives are not isolated, so that they might have been more thoroughly shown, because all that I have done by this application are in my scrap-book, and the best specimen is to be found on leaf 19, No. 2, *Ruined Cottages at Garelochhead*. Most of the impressions by this process are, if anything, under-exposed, and I would say the proper time should be, with the single lens of a Vogitlander quarter-plate, not less than four minutes for sunlight, and twelve for diffused light. Its tendency, like most processes under short exposure, is to be too dense in the high lights. However, the impression referred to shows what the process is capable of rendering under full exposure.

The next and last process which I now bring before you is one with which I have had but very recent experience, viz., a gelatine emulsion dry plate, as made by Mr. Peter Truefitt a well-known photographer of this city, but I am sorry as yet not a member of our Society, which he should become. Having had my attention called by Dr. Nicol's remarks at some of our meetings on Mr. Truefitt's success in making a very sensitive emulsion I was resolved to try it, and at once I got him to make me a dozen half-plates. I was much pleased with the apparent very evenly-coated opaque surface which they possessed, but I was much more pleased with the result of my first attempt, as seen in the impression, leaf 23, of my scrap-book, a portrait of my eldest son. The time of exposure by a north light in my studio with the window half shut was not more than fifty seconds. The quality of that photographic result from a dry plate, and taken in a room comparatively obscured, which with a wet plate would have required nearly two minutes, I am persuaded is a wonderful triumph.

I cannot conceive anything more like the tone and quality of an old master—so sweet in the gradations, and rendered without any dodging or treatment of light, nothing but simply the source of light as let into the room from half a window. I am particularly anxious to call your attention to this—the importance of being able to produce the ordinary and everyday familiar effects of our dwelling houses, which are infinitely superior to the vapid effects of glass-houses, never indicating the source of light. With so sensitive a dry-plate process it is quite within reach to secure effects under the most confined light. I solicited Mr. Truefitt to let me show you tonight some of his negatives, believing that to appreciate fully their quality you must see them. One or two of them done in the open air were almost instantaneous; others, much slower, were taken in obscure places (such as the *Abbey Corner*).

I had a great curiosity to test the power of this process in the copying of paintings, and was anxious to give you some idea of that tonight. With this view I sent up today a portrait which I had newly completed, so that Mr. Truefitt might try it. As you all well know to your disadvantage, it has been extremely and unusually dark, the air being charged with yellow, green, and I know not what non-actinic colours by reason of the fog. He was very unwilling to try this, and sent a message that it was absurd to attempt it. However in the course of the day he did try it, exposing the plate for half-an-hour. I now show you the negative; you will see that it is short of time considerably, but, nevertheless, as the colour of the deposit is very non-actinic a passable print might be taken from it. I hope to show you an impression from the same subject taken with good light—if possible by the next meeting of the Society. In case I might not have the portrait with me then I shall now exhibit it, as it is necessary you should have some idea from what it has been derived. NORMAN MACBETH, A.R.S.A.

NOTES ON PASSING EVENTS.[*]

By a Peripatetic Photographer.

The latest new scientific sensation is the telephone. Neither in the course of my wanderings nor of my varied reading had I heard of the application of this instrument to the uses of the photographer until last week, when, reading a newspaper published in the Orkney Islands, I was made aware that a photographer in Kirkwall had put himself in the position of being the first in this country, so far as I am aware, of applying the telephone to the requirements of his business. He has himself constructed a telephone, and by its means has thus brought his house and his studio, which are about a quarter of a mile apart, within speaking distance of each other. Is it greatly to the credit of the enterprise of the photographic artists within a few hundred miles of the great metropolis that an example how to utilise an obviously valuable and simple adjunct to their business should be set by a photographer in a small town situated in the sixtieth degree of north latitude?

The expedient for preventing the diaphragm from dropping out of the lens tube suggested by Lieut. Lysaght is as excellent as it is simple. When a landscape photographer shoulders his camera and stand in the course of his roamings among scenes fitted for photographing, it not unfrequently happens that the diaphragm will drop out of its place in the lens and be no more seen by the artist. Especially does this happen when he climbs over a stile or jumps a ditch, both of which feats he may have to accomplish many times in one day. Seeing that a loss of this nature may be avoided by such a simple expedient as slipping an india-rubber band over the lens tube in such a manner that it shall press upon the diaphragm, I think it may be assumed that few lenses having movable stops will in future be used in the field without this elastic adjunct. Heretofore I have been in the habit of giving my diaphragms a slight bend, so as to make them bite the slit in the tube to such an extent as to prevent them from dropping out in any position, even when held upside down.

But there is a point in the suggestion of Lieut. Lysaght which I should like to controvert. It is that which is implied in preventing "the access of diffused light to the plate through the opening for the diaphragm." Now, supposing that this opening *is* exposed in an uncovered state, will any light be admitted thereby? Light travels in straight lines, and for this reason it is impossible that any direct ray can fall upon the plate through the diaphragm opening in the tube. All that can possibly take place will be the illumination of the bottom of the well into which the diaphragms are dropped, or perhaps a little portion of the interior of the tube in the vicinity of this well. From this latter portion a little light may, doubtless, be radiated, but it is literally nothing when compared with that which the mount radiates from other sources, such as the light of the sky which falls upon the lower side of the interior of the tube. A lens mount in which the opening is sufficiently wide to allow direct light to be transmitted, would indicate such carelessness on the part of the maker as to make it reasonable to assume the existence of other errors that would render desirable its being subjected to a complete overhaul.

One effect of the unwise act of the jurors in the late Photographic Exhibition of withholding medals offered for the best productions in certain classes will probably be the preventing of any photographer exhibiting in these classes in future. While it is quite true that they had the right of withholding any medals they thought proper, it seems universally admitted that they have not exercised this power in a judicious manner. Was there only one *genre* picture among the many in the exhibition that deserved recognition? Not even *one* portrait smaller than 12 × 10 that was better than its fellows? Was there not a *best* among the numerous animal subjects exhibited? Was there only one *instantaneous* picture worthy of receiving a medal, which, after all, was given for pictures that could not possibly come under this category? And are not those who exhibited transparencies and apparatus in a position to charge the society or its jurors with a breach of faith in withholding that which was promised? The action of the jurors is unwise, and it may jeopardise the success of future exhibitions. The only way of preventing such ill effects will be to import jurors in future from a distance. But, it will be asked, what does this advice *imply?* Here, however, I leave the subject for the present.

From a statement that I understood was recently made in a public meeting, it would appear as if some makers of magic lanterns claimed for their lamps a degree of power that I scarcely imagine would be at all warranted by the photometer. It is very easy to talk about lamps having a hundred or a hundred-and-twenty candle power, but it is very difficult to verify such statements, and still more so to construct the lamps by which such a degree of illumination can be obtained. There was a capital bit of satire which appeared in *Fun* a fortnight ago, and, although intended to apply only to the illuminating power of the gas supplied by a certain company, is equally applicable to the claims made on behalf of lantern lamps. Taking a considerable liberty with the *ipsissima verba* of our contemporary, I introduce a complainant who says to the lantern maker:—"You said that your lamp equals a hundred and forty candles; but I have tested it and find your statement to be erroneous." "I am quite correct, I assure you," says the maker; "but, pray, how did you test it?" "By the simplest method in the world," was the rejoinder. "I procured the requisite number of candles and lighted them, and your lamp gave an insignificant light by comparison." "Oh! but I never said that it equalled a hundred-and-forty *lighted* candles, which makes all the difference in the world!" This requires no comment.

Our Editorial Table.

DUBLIN UNIVERSITY MAGAZINE.

The recent issue of a new volume of the life of the late Prince Consort directs public attention somewhat forcibly to Mr. Theodore Martin, the author of that work. With the energy which has of late distinguished the conductors of the *Dublin University Magazine*, they have almost simultaneously with the appearance of the third volume of the work above named issued a portrait of Mr. Martin, accompanied by a sketch of his career and literary labours. The portrait is a very fine one, and quite up to the high quality of those lately given in this *Magazine*. It is a profile, the negative being by Lombardi and Co., and the printing by the Woodbury mechanical process, which is now invariably adopted in connection with the illustrations of the "Portrait Gallery" of the *Dublin University Magazine*. Mr. Martin was born in Edinburgh, in 1816, in which city he practised as a solicitor until 1846, when he settled in London as a parliamentary agent—a position which he still retains. Literature is with him the recreation and not the occupation of his life. Professor W. F. Barrett's *Demons of Derrygonelly* forms an excellent sequel to the paper he read at the Glasgow meeting of the British Association, and which provoked such a storm. Mr. F. R. Conder, C.E., discourses on *The Folk-Lore of Christianity*, and with these and other articles an enjoyable number—the last under the present title—is presented.

MEN OF MARK. (Second series).

London: Sampson Low and Co.

If we were asked to indicate any special collection of portraits we should recommend to photographers as containing the most perfect studies of light and shade and breadth combined with sharpness, we should unhesitatingly name *Men of Mark* as that which fulfilled best these conditions. This work was commenced last year under the superintending care of Mr. George C. Whitfield, a member of the firm of Lock and Whitfield, and the first series having been concluded at the close of 1876 a second series was commenced, and is now completed under the same management. The present series of *Men of Mark* contains thirty-six portraits of "men distinguished in the senate, the church, in science, literature, and art, the army, navy, law and medicine." With two exceptions all these portraits have been taken by Messrs. Lock and Whitfield, these exceptions being Jules Verne (by M. Adam-Salomon) and Victor Hugo (by M. Carjat). The introduction of such portraits affords an opportunity of comparing the works of distinguished foreign artists with those of equal distinction in this country, with a result which must be gratifying to those good patriots who cannot discover anything abroad which surpasses "our own glorious constitution and institutions." Among the thirty-six portraits here presented there are indeed many "men of mark." Opening with Mr. Frederick Leighton, R.A., whose portrait is in profile, we soon come upon the open, honest face of Professor Tyndall, by which we are reminded that "once upon a time" it was our good fortune to receive a volume of portraits of men who were famous in the world of science, that of Professor Tyndall forming one of the number. These portraits of a former period are now "faded and withered;" most of them, in fact, seem to have been bleached out of the paper upon which they were printed. With the "men of mark" in the volume now under review no such fading can possibly take place, these portraits being printed by the Woodbury process, which is a guarantee not only for the faithful rendering of a negative but of absolute permanence. The portraits respectively of Mr. William Black, the Right Hon. Sir Stafford Northcote, Sir George Biddell Airy, the Hon. Sir William R. Grove, and Sir John Lubbock are exceedingly striking for their lifelike fidelity. Captain Burnaby, of Asiatic celebrity, Mr. Gustave Doré, Sir John Gilbert, the Right Hon. Lyon Playfair, Mr. James Nasmyth, and others of equal celebrity, are all here assembled, forming, out of elements of a diversified character, one harmonious whole. It need scarcely be said that a page of descriptive and biographical text accompanies each portrait, written by Mr. Thompson Cooper, F.S.A. The characteristics of these portraits are singular clearness, perfection of detail, skilful posing, and light and shade rendered in the most unexceptionable manner. We commend *Men of Mark* as a study to photographers.

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[*] Concluded from page 581.

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STREET LIFE IN LONDON.

London: SAMPSON LOW AND CO.

THE December number of *Street Life* contains three pictures, respectively *Italian Street Musicians, The Street Locksmith,* and *The Seller of Shell-fish.* On the difficulties of posing and properly photographing such groups and scenes as those here depicted we have frequently commented, and much credit is due to the artist for the clever manner in which he has managed the task.

Meetings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE usual monthly meeting of this Society was held on Tuesday, the 11th instant, the chair being occupied by Mr. Valentine Blanchard, Vice-President, in the absence of the President through indisposition.

Messrs. Brooker, E. Brightman, W. S. Hobson, and Arthur Hill having been elected members,

Captain Abney, F.R.S., read a paper *on Emulsions.* This was followed by the reading of a second paper by Mr. Herbert B. Berkeley on the same subject. Both these papers will appear in our next number.

We have decided not to give a detailed report of the discussion till the papers are published, as without them the discussion would not be understood. We may, however, present a summary of the proceedings by stating that Mr. William Bedford exhibited a number of negatives taken by the original washed collodion process of Mr. W. B. Bolton, of which he gave an outline. He found that the preparation of the pyroxyline to be employed in this process was of the utmost importance. He preferred an emulsion containing a trace of free bromide, as it gave finer and cleaner results and was more manageable than one in which the silver was in excess, although it was slower. In reply to a question by Mr. Sebastian Davis, Mr. Bedford stated that he gave an exposure of ten minutes; and in answer to a question by Mr. Jabez Hughes he said he preferred giving, with the emulsion he prepared, an exposure ten times longer than he would give to a wet collodion plate. Photographers often overrated the sensitiveness of dry plates; the best results were obtained by giving a full exposure.

Mr. R. KENNETT found that he could make gelatine emulsion quite as sensitive as the most rapid wet collodion process, and he cited an instance in which his ordinary plates, for which no extraordinary degree of sensitiveness was claimed, had been tested against wet collodion, the result being in favour of the dry plates.

Mr. NESBITT, when experimenting with emulsion prepared according to Capt. Abney's directions, had found the plates to give numerous blisters, which he attributed to the albumen in the emulsion. In proportion as this was diluted with plain emulsion so did the blisters disappear. The emulsion he made himself was quite as sensitive as wet collodion.

Mr. HENRY narrated an experiment in which emulsion he had made with bromide of zinc had been tried against two other preparations, viz., the wet collodion process and some negative tissue by Mr. Warnerke. The result showed that they all poseessed the same sensitiveness.

Mr. JABEZ HUGHES corrected a remark of a historical nature made in Capt. Abney's paper. [We may explain that a portion of the paper had been devoted to a description of certain methods of annihilating or removing the fog caused by exposing a bromised plate to light, such as by treatment with iodides or bromides, or with nitric and other acids. Capt. Abney had spoken of the analogy existing between this method and that of Mr. Shaw, of Birmingham, who, many years ago, had found that a daguerreotype plate which had been exposed to light would have the effect of that luminous action completely destroyed by giving the plate a very brief exposure to the vapour of iodine or bromine.] The purport of Mr. Hughes's remarks was that, although Mr. Shaw did undoubtedly publish this in the *Philosophical Magazine,* it was long prior to that time well known to all the leading daguerreotypists, and constantly practised by them.

In reply to a question by the Chairman respecting the rapidity with which dry emulsion plates could be developed,

Mr. KENNETT said that in his hands he preferred the image to appear in about forty seconds, the development to be completed in three minutes.

Mr. BEDFORD developed very quickly, using much ammonia. He then washed the plate and intensified with acid pyro. and silver. Compared with wet collodion plates, dry plates occupied rather longer in the development. In respect of sensitiveness Mr. Kennett's plates were certainly very rapid, and no other experimentalist had succeeded in obtaining an equal degree of rapidity.

Mr. ENGLAND said that when proper exposure was given a dry plate did not require a much longer development than a wet plate.

We shall resume the subject in our next, when the papers read will be given.

At the next meeting a paper on *Microscopic Photography* will be read by Mr. E. Viles.

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SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE annual meeting of this Society was held on Thursday, the 6th inst.,—the Rev. F. F. Statham, M.A., President, in the chair.

Messrs. Frank Bishop and Edward William Stowell were elected members.

The Secretary then read the following

ANNUAL REPORT.

YOUR Committee, in presenting the annual report for the session of 1877, congratulate the members of the South London Photographic Society upon the character and amount of work which has been brought before their notice, and which, having been of an exceedingly practical nature, has afforded the members occasions for conversational discussions; and these being one of the most valuable portions of the Society's sphere of usefulness, your Committee express the hope that young members will avail themselves of the opportunities thus offered for acquiring practical information from their more advanced brother experimentalists. At the same time, your Committee throw out a suggestion that, as tending to develope still further this branch of the Society's proceedings, it would derive much aid if short papers could be read upon comparatively little matters, upon which the experence of others, through these conversational discussions, might be made useful to all.

Your Committee are pleased also to have to offer congratulations upon the result of this year's Techinal Exhibition meeting. The opportunity for new ideas and inventions to be thus brought before the notice of the photographic world is all that your Society can do; the result must entirely depend upon inventors, who are freely invited to make known their productions. At the same time the institution of such a meeting is entitled to support and worthy of success.

The following papers have been read during the session:—*The Collodion Bromide Process Applied to Transparencies and Enlargements Without a Nitrate Bath*, by W. Brooks. *Collodio-Bromide Emulsion*, by P. Mawdsley. *On Drawbacks*, by E. Dunmore. *Photographic Difficulties*, by F. York. *The Nitrate Silver Bath*, by B. J. Edwards. *Spots in Emulsions: their Causes and Remedy*, by W. Brooks. *Educational Aid by Photographic Exhibits*, by T. J. Pearsall, F.C.S.

Mr. W. Brooks made a communication respecting experiments he had made with a magnet for the production of a photographic image. Mr. Warnerke gave a description, and demonstrated the action, of bromide of copper as an intensifying agent.

Photographs, transparencies, new inventions, and appliances have been exhibited by Messrs. Brooks, Ayling, Ferneley, Cutchey, York, Warnerke, Lane, Pearsall, Bolas, Baynham Jones, Reeves and Hoare, Dunmore, Aldridge, Ayres, Cocking, Taylor, Penny, Allan, Clarke, Harrison, Dallas, Woodbury, and Wright and Co.

In conclusion: your Committee hope that as the basis of your Society's success is built upon the amenities of social intercourse, where the good of others is considered beyond the individual, so they trust the Society may go on prosperously in its mission of practical work, and that the forthcoming session may be valuable in new ideas and fresh developments of existing facts.

This report having been adopted, it was announced that the Treasurer would defer giving his statement till next meeting.

The Society then proceeded to elect officers and committee for the ensuing year, when the following were chosen, viz.:—*President:* Rev. F. F. Statham.—*Vice-Presidents:* Messrs. Simpson, Hughes, Howard, Brooks, and Mawdsley.—*Committee:* Messrs. Aldridge, Ayres, Bolas, Dunmore, Fry, Nesbit, Warnerke, and York.—*Treasurer:* Mr. F. Bridge.—*Secretary:* Mr. E. Cocking.

The thanks of the meeting were awarded to the President and the other officials for their services during the past year.

Mr. J. Lane exhibited a portable camera for 5 × 4 plates, the peculiarity of which consisted in its having a reversible back, by which the slide containing the plate could either be placed in a horizontal or a vertical position without necessitating the removal of the camera from its stand. The camera was well received and elicited expressions of approval from the members.

Agreeably with a notice previously given, it was decided to add to the existing laws one empowering the election of honorary members; and in accordance with this law Messrs. P. Le Neve Foster and Thomas J. Pearsall were elected honorary members accordingly.

The proceedings then terminated.

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EDINBURGH PHOTOGRAPHIC SOCIETY.

THE second ordinary meeting of the session was held at 5, St. Andrew-square, on Wednesday evening, the 5th instant,—Mr. W. H. Davies occupying the chair.

The minutes of the previous meeting having been approved, the following gentlemen were unanimously elected ordinary members of the Society :—Messrs. John Bonar, J. D. Adams, William Halkett, William Cowan, — Kirkwood, James Coutts, — Michie, William Mathison, J. G. Goodman, and James Pillans, Jun.

Mr. Norman Macbeth, A.R.S.A., then read a paper on *The Comparative Merits of Different Dry-Plate Processes.* [See page 292.] The paper was illustrated by a number of negatives produced by many processes—from the old calotype to the most recent gelatino-bromide methods. Extremely varied subjects were represented, from the ancient and massive monuments of Egypt to the quiet, shady nooks in an old Scotch kirkyard. Neither was portraiture wanting, as some most successful portraits were shown possessing all the qualities so much appreciated by the *artist* as distinguished from the *photographer*, these being produced by means of dry plates in an ordinary room with half the window blocked up, the time occupied not being longer than that required in the photographic glass-house.

Mr. W. NEILSON, in referring to the gelatino-bromide plates, remarked that Mr. Gray was the author of the process, he having experimented on it for years past, and worked it out to its present high position. So sensitive had he found Mr. Gray's plates that by an inadvertent exposure of three seconds he had found the plate spoiled by over-exposure. He congratulated Mr. Macbeth on the very interesting and instructive matter brought forward, and considered the exhibition of failures in juxtaposition with non-failures was a very happy thought. He (Mr. Neilson) concluded by remarking that he who said he had no failures was in himself the greatest failure of all.

Mr. ALEXANDER MATHISON spoke of the high sensibility of the gelatino-bromide dry plates, and showed the negative of a horse which had been most successfully obtained by an exposure of six seconds, using a rectilinear lens. He remarked that a novice was liable to be much deceived by the character of the films, for so very non-actinic in colour were they that what would usually be deemed a mere "ghost" was found to produce the most brilliant results when printed. In exhibiting a number of collodio-bromide negatives of exceptionally good quality, he took occasion to remark that whether the bromide were suspended in gelatine or collodion the plates showed a remarkable immunity from all the stains and other defects so common in many other processes.

Dr. NICOL said there was hardly a limit to the sensitiveness of Mr. Gray's plates. The only thing to be guarded against was admission of white light to the plates in any stage of their production. The fogging that some complained of was wholly due to the admission of too much light in the dark room; absolutely clear plates, even with the most sensitive films, could be produced with certainty if due regard were paid to this particular. So well satisfied were some professional photographers who had tried it, that they had bought the method of production from Mr. Gray, and in more than one case the bath had been wholly superseded by these dry plates, even for ordinary portrait work.

Mr. ANNAN thought very highly of Mr. Gray's process. He understood the inventor claimed the introduction of a distinctly new and original ingredient as a special feature of his emulsion, and it was to this particular material, which was used in large quantities, that he ascribed the keeping qualities and the exalted sensitiveness of the emulsion. In his experience he found it much easier to coat large plates with gelatine than with collodion.

The CHAIRMAN elicited the information that "cockling" or "buckling" of the edges and blisters were quite unknown with these plates, and that whenever those defects occurred in *any* process it was due to a peculiar quality of the gelatine employed.

Some of the prints furnished by Mr. Murray in illustration of Mr. Macbeth's paper also showed the relative merits of several methods of printing. Prints by the collotype, zincographic, and other fatty-ink processes were exhibited side by side with silver prints from the same negative. This was a very interesting feature; one print from a collotype negative of the *Ruins at Luxor*, by Mr. Murray, printed by Colonel James, of the Ordnance Survey, Southampton, was specially noticed.

The CHAIRMAN exhibited a magnificent copper plate twenty-one by sixteen inches, produced from one of his negatives—a reproduction of an oil painting, by Mr. Norman Macbeth, A.R.S.A.—together with a print on plate paper from the same. He said its origin was due to the late Edinburgh photographic exhibition, at which the exceedingly beautiful productions of M.M. Goupil were so much admired, and for which one of the silver medals had been awarded. He felt a peculiar satisfaction in exhibiting this the first of its kind that had reached Scotland. The resulting prints were so very satisfactory that other artists of eminence had already decided to have their pictures reproduced by this "photogravure" method.

The plate and print were examined with extreme interest.

Mr. MACBETH, in reply to queries, stated that the plate only appeared touched by the graver in those points where the light had caught the particles of dust, &c., adhering to the surface of the painting. He thanked Mr. Davies for submitting such an interesting production to the criticism of members, and said that no engraver could have reproduced his picture so perfectly; for, when an engraver copied a picture, he merely translated his idea of it, the result being in a totally different language, whereas in the example exhibited there was the absolute reproduction of the individuality of the artist, and he could not conceive of anything more valuable than that.

Mr. DOBIE said he had made many attempts to produce copper plates by electro-deposit on impressed gelatine, and the only difficulty he had to contend against was the action of the bath or vat of sulphuric acid on the tender film. If he had any means of overcoming this he was certain that copper plates could be prepared at a very small cost.

A fluid lens, by Archer, was presented to the Society by Mr. G. W. Wilson, of Aberdeen, through the President. The historic relic was examined with much interest. It will be placed among other treasures of the Society, suitable rooms for which it is hoped will shortly be provided.

Mr. MACBETH next paid a grateful tribute to the memory of the late Mr. Alexander MacGlashon. He said that the Society should not allow that meeting to pass, seeing it was the first which had been held since Mr. MacGlashon's decease, without paying a tribute of respect to his memory. From the commencement—not merely of that Society, but of photography itself, Mr. MacGlashon took a most prominent part in following and contributing to the progress of each. Being of a highly-inventive and mechanical turn of mind, he did much in the way of improvement in the construction of cameras, chemical apparatus, and certain types of photography with a view to printing purposes. He was among the foremost, after Messrs. D. O. Hill and Adamson, to put the size and style of their calotype portraits into prominence by the collodion process. The Society would long remember the impression which those portraits made on the public at large—composed with a simplicity and grandeur which made them stand by themselves as works of art. Mr. MacGlashon was well known in his profession proper, being for many years the first copperplate printer in Scotland. He (Mr. Macbeth) had personally a most pleasing recollection of the kind and obliging manner in which the deceased had met the wishes and tastes of artists and engravers in producing with the greatest pains a true rendering of their works. The self-sacrificing disposition in devoting his fertility of resource for the benefit of any who sought his advice or services was a marked feature in his character, and would be long cherished in the memory of all who had the privilege of his acquaintance.

The Chairman, Mr. Anderson, and others spoke in similar strains.

Votes of thanks were awarded to Mr. Macbeth, Mr. Murray, Mr. Matheson, Mr. Davies, Mr. Wilson, and then a peculiarly interesting meeting was adjourned.

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WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.

THE above Society held the first meeting of its fourth session on Monday, November 5.

The minutes of the previous meeting having been read and confirmed, sundry arrangements for the forthcoming *soirée* were made.

The Secretary then read the

ANNUAL REPORT.

IN presenting the third annual report of the Society, the Council have to congratulate the members on the completion of another year's successful work. The Society still flourishes numerically, and the attendance has been good. Three members have resigned during the year. Death has removed two, and eleven new members have joined, the number of members being more than previously.

The season has been productive of good work; the papers read have been as follows:—*On Albumen*, by Mr. A. Clark. *On Carbon Printing*, by Mr. Braybrook. *On the Dusting-on Process*, by Mr. Crosthwaite. *Some Stray Thoughts on Carbon Printing*, by Mr. Jno. Smith; and a miscellaneous paper, by Mr. A. Sachs. An interesting lantern exhibition was given by Mr. Crabtree. A campact set of apparatus for field work, exhibited by Mr. Cook—who likewise showed a number of photographs by M. Kareline, and a number of appliances for promoting and simplifying carbon work—was shown by M. J. Smith and Mr. E. Greaves.

The annual *conversazione*, held in November last, is remembered as a most successful meeting, a large number of pictures being exhibited and a very delightful evening spent.

Three excursions have been held during the summer vacation, namely, to Kyeburn Valley, Milner Field (the residence of Titus Salt, Esq.), and to Roundhay Park. They were well attended, and a fair sprinkling of cameras appeared in the field.

In conclusion: the Council would still impress upon the members the necessity of keeping the interest of the Society constantly in view, and of using every endeavour to promote its success, as a society can only flourish and become popular by its members all recognising the necessity of working in unison and allowing a pleasant and amicable feeling to prevail at all its gatherings.

The treasurer then read the financial statement, which showed a balance in hand. The report and balance sheet being adopted,

The members then proceeded to the election of the officers for the ensuing session, with the following result:—*President:* Mr. E. Greaves (Halifax).—*Vice-President:* Mr. W. Smith (Leeds).—*Treasurer:* Mr. T. Burrow (Bradford).—*Auditor:* Mr. A. Megson (Bradford).—*Secretaries:* Messrs. J. Crosthwaite and J. E. Greaves.—*Councillors:* Messrs. Wormald, Holgate, Broadhead, Gunstone, J. Smith, Howarth, Sachs, Jenkins, and Passingham.

The Society then tendered its best thanks to the retiring officers, which were suitably acknowledged The meeting was then adjourned.

THE same Society held its third annual *soirée* on the 28th ult., at the Belle Vue Hotel, Bradford. About seventy members and friends sat down to tea.

The evening was spent in a social manner. Songs, duetts, and recitations were given by those present, and during the intervals the numerous pictures adorning the walls, and the apparatus on the tables, were examined.

The PRESIDENT in his address gave the company a hearty welcome to the annual meeting, and congratulated the members on the large number of excellent pictures gathered together for their edification. He was glad to see a growing interest in the Society, each successive year bringing forward a larger number of contributors towards the success of the meeting. A great deal might be learnt from a careful study of work by the leading men. All the pictures shown that evening were of a very high character, many of them being veritable works of art. He had visited the exhibition at London a short time previously, and did not hesitate to say that the Council had been successful in securing most of the best pictures. With regard to the local exhibits, he was glad to see the growing tendency to permanent printing, almost all the productions of the local artists being printed in permanent autotype, and he might safely say that the results were far superior to silver prints. Whatever opposition carbon printing might meet with on account of little difficulties of manipulation, there was most certainly a glorious future before it, and he had no doubt but that it was essentially the process of the future. He would not take up the time of the meeting, as he thought it might be more agreeably employed than in speech making.

A number of musical selections were then rendered by the members and friends in a very pleasing and entertaining manner.

Mr. Davis, of Bradford, exhibited a telephone, which excited much interest, the dialogues being carried on very satisfactorily.

Among the pictures exhibited (over 200 in number) were noticeably some fine specimens of chromotypy and carbon enlargements, by Messrs. Appleton, of Bradford. A large number of portrait studies by Mr. Boucher, of Brighton, were splendid examples of lighting and posing. Mr. Brigham, of Scarborough, exhibited a fine set of large direct pictures. Some of candle-light effects were well managed, the modulations of light and shade being exquisite. One case of carbon prints was particularly noticeable for the admirable rendering of white draperies. M. Boisonnas' famous collection of children's portraits received much attention from the ladies present. The various studies by Mr. V. Blanchard were much admired, being very tender in feeling, but withal brilliant, the medal picture being considered severely classical in treatment. Mr. Bowness, of Ambleside, had on view several very fine landscapes—views in the lake district—having a very soft, atmospheric quality, which claimed for them the firse position amongst the exhibited landscapes of large size. Mr. E. Brightman's exhibits, though small, were the very essence of quiet English landscape, his calm pools, with floating lilies and gently-flowing streams under noble trees, being the work of a man of genuine poetic and artistic feeling. Mr. T. Burrow, of Bradford, exhibited a number of 12 × 10 landscapes by the "Liverpool" emulsion process, which were good examples of work. The views of Swiss scenery shown by Mr. W. England in his well-known style need no comment. Mr. A. Ford Smith, of Llandudno, had some fine examples of combination printing, the backgrounds being very appropriate and in good keeping. Amongst the gems of the exhibition was a frame containing three portraits of a child—*Studies of Expression*—by Mr. R. Faulkner. Printed in red chalk, they had the character of those splendid old engravings by Bartolozzi of the old masters' drawings, now so seldom seen—one head being exceptionally beautiful and tender in treatment, reminding one of a drawing by Raphael. Mr. Faulkner likewise exhibited a large number of other portraits of children, amongst which was the well-known *Little Dorothy*, and many of a similar character. Mr. Greaves, of Halifax, exhibited several frames of cabinet and imperial pictures in autotype of very considerable merit and delicacy of manipulation. Mr. Frank Howard's landscapes were judiciously selected, but somewhat cold in tone. Of a frame of landscapes by Mr. Payne Jennings it is scarcely too much to say that the perfection of landscape art has been reached; it is difficult to imagine anything finer. Mr. Lafosse's *Finishing Touch* was on view, and considered by many one of the finest pictures in the exhibition. A dozen studies of posing, by Herren Loescher and Petsch, contributed by Mr. J. J. Atkinson, of Liverpool, were remarkable for ease in pose and admirable keeping of background, a good artistic feeling pervading the whole of the pictures. Two frames of landscapes by the emulsion process, exhibited by Mr. P. Mawdsley, spoke volumes in favour of the process, some of them being fully equal to fine "wet" work. A number of bold studies of heads, by Mr. Nesbitt, of Bournemouth, were full of brilliancy. One noticeable frame contained a number of chromotypes by Sir Thomas Parkyns. Toned to various colours by his new process they were novel in effect, the colour being somewhat vivid. It is, however, likely that some modification of the process will prove of service to the art. Mr. Passingham, of Bradford, exhibited an admirable portrait of himself in oil; also some frames of enamelled silver prints of very high degree of finish, the pictures themselves being very artistic in treatment. Mr. Sachs, of Bradford, had on view a fine opal picture of two children, of large dimensions, and several frames of chromotype prints in his well-known style of excellence. *Alone*, by Mr. R. Slingsby, of Lincoln, attracted considerable attention, the figure being admirably posed and the background in good keeping. Mr. Wormald, of Leeds, contributed four large frames of interiors of noblemen's residences and public buildings, printed in permanent autotype, the pictures being broad in treatment and full of detail. *The Fisher's Wife*, by Mr. B. Wyles, was a good example of the so often attempted "moonlight" effect. Mr. Wyles has been very successful, the picture being harmonious in light and shade, and the details judiciously suppressed to the general effect. His *Autumn Evenings*, too, was much admired, the dreary, desolate waste of shore being admirably rendered. Mr. L. Warnerke contributed some good examples of tissue negatives and emulsion work, and also a splendid specimen of photo-engraving. Several portrait groups by Mr. Young, of Llandudno, were good in arrangement, but perhaps rather too low in tone. Many other pictures of great merit were also exhibited.

An interesting lantern exhibition by Messrs. Burrow, Howarth, and Rogerson was given during the evening, when Young's generator and a collection of slides, kindly lent by Mr. York, were used.

A good collection of apparatus was also shown, as follows:—A scenograph by the Woodbury Company; a Scovill camera and patent argentometer, by Mr. J. J. Atkinson; a set of printing and tinting frames, with vignetting appliances for carbon printing, by Mr. Greaves; and a number of stereoscopes by Messrs. Harvey, Reynolds and Co., Leeds.

The meeting broke up about twelve o'clock, the visitors having spent a most delightful evening.

The pictures remained on view for three days, during which time they were visited by a large number of people.

BRISTOL AND WEST OF ENGLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE ordinary monthly meeting of this Association was held at the Museum, Queen's-road, Bristol, on Wednesday, the 5th instant,—Mr. G. Webber in the chair.

The minutes having been read and confirmed,

The Chairman called upon Mr. E. Brightman to exhibit the new pyro.-hydrogen light for the magic lantern. The examination of this new and most simple arrangement for a powerful light was very interesting, the light being nearly if not quite equal in intensity to the oxy-hydrogen light.

Mr. H. A. H. DANIEL passed round for examination one of his negatives, the varnished surface of which presented a very peculiar appearance. There seemed to be a perfect network of a very fine mesh completely covering the negative. It did not exist below the varnish, nor, he affirmed, did it in the slightest affect the printing. He said the varnish was made by an amateur, which was considered so excellent in quality that many of his friends used it in preference to any other. He should like to hear the opinions of the members as to the character and result, if any, of such marks.

Lieut. LYSAGHT did not consider the markings cracks, but rather very minute folds, through expansion of the varnish consequent upon the gums not being properly balanced. He recommended removing the varnish by exposure to alcoholic vapour, and re-varnishing.

Mr. BRIGHTMAN considered that course rather dangerous, and proposed immersion in preference.

Mr. DANIEL said that unfortunately many of his finest negatives (including the prize-medal one) showed symptoms of the same state of things, some being equally strongly depicted.

It was generally admitted that the peculiarity was most extraordinary.

A vote of thanks was passed to Mr. Brightman and the Chairman, and the meeting was adjourned.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

The Board of Mangement of the above Association held their monthly meeting at 160a, Aldersgate-street, on Wednesday, the 5th instant.

After the minutes of the previous meeting had been read and confirmed, Mr. Bolas proposed and Mr. Hall seconded "that Mr. Massey be elected an ordinary member of the Association." Mr. Cussons was enrolled as honorary member.

The annual general meeting was decided to be held on Wednesday, January 2nd, 1878, at the office of the Association, when it is hoped a large attendance of members and their friends will take place. The chair will be taken at 8 p.m.

PHOTOGRAPHISCHEN VEREIN FUR BERLIN.

A meeting of this Society was held on Thursday, the 6th inst.,—Herr C. Brasch in the chair.

The minutes of the last meeting were read and confirmed.

The proprietor of The British Journal of Photography had forwarded a copy of the Almanac as a present to the Society, which was accepted. It was resolved to forward a hearty vote of thanks to Mr. Greenwood for his kindness.

The Chairman then laid before the members a beautiful collection of microphotogaaphs, by Herr Grimm, of Offenburg, and forwarded by him as a present to the Society. They were examined by the assembly with the utmost attention, and declared to be first-rate work.

Herr **Ernst Düby** then read a paper treating on heliogravure and the different phases of its development. He showed how from the beginning of the art there had bsen a tendency to substitute for the rather troublesome and expensive work of the usual printing from the negative on albumenised paper a method that would allow the production of pictures on lithographic stones or metallic surfaces. The first patents respecting such a method were granted to MM. Lemercier, Lerebourg, and Barreswille in the year 1852. Herr Düby then proceeded to demonstrate the first method of photolithography, and exhibited the portrait of a member, Herr William Werner, chief photographer of the Royal printing establishment, taken in 1852. A common lithographic stone, after being carefully polished, had been "grained" by means of sand and water, so as to render it capable of reproducing half-tones. Afterwards a solution of asphalte in oil of turpentine was mixed with drops of a solution of nitrate of silver in oil of turpentine; the solution occupied several weeks. This mixture is carefully extended on the stone by means of a roller. When dry the stone is exposed to the light under a negative, which generally takes from one to three days, when the picture, which is already somewhat visible on the stone, must be developed by means of a sponge dipped in turpentine and linseed oil. It will soon appear distinctly and with considerable force; then the stone must be etched, after which, the remainder of the alsphalte being removed, it may be inked and printed from. He (Herr Düby) exhibited a lithographic stone prepared by him in this manner, which excited great interest.

Herr Herman Rock, photographer to H.R.H. Prince Frederic Charles, exhibited a new apparatus invented by him for reproduction work. This apparatus consists of a box fixed on a sort of movable gibbet, fastened to the camera-stand, and capable of being turned horizontally. If it be wished to reproduce a positive picture the same must be placed in the box, and covered with a clean glass pan. If a negative be required from which to obtain a diapositive, the box is turned on its axis, the negative fixed to it by means of two crotchets, and then a sort of bag fastened to the box is drawn over the negative to shut off all superfluous light; this apparatus may be turned in every direction and will always remain steady.

The members unanimously agreed that for reproductions this apparatus was the best exhibited.

Herr Charles Tricke showed some proofs varnished with a particular composition of wax and other substances, the secret of which, however, he did not reveal. It was stated that by means of this varnish the appearance of the pictures was greatly enhanced. However, it was found that by the so-called *heissatinirmachine* (hot-burnishing machine) the same effect might be produced, and that by it the pictures were not so much exposed to be injured by scratches, as often happened when they were rubbed with wax or similar composition.

Herr Theodor Soop stated that for hot burnishing it was not absolutely necessary to have such a machine, and that he had found an old common one to be quite sufficient for the purpose.

It was stated that on pictures rubbed with these varnishes the retouching would soon afterwards be visible, by which they lost their value.

Herren Braun and Co., of Dornach, sent a beautiful collection of carbon pictures, reproductions of statues, paintings, and landscapes. They were examined with all the admiration due to the productions of this firm.

Herr S. Rirfelder, of Bern, forwarded a beautiful collection of Swiss views for presentation to the Society.

Among them were some ice-mountains, portions of the Swiss Jura railroad, and other interesting views. The ice-mountain pictures were particularly interesting, some of them having been taken at an elevation of about 10,000 feet, which entailed a good deal of difficulty and hard labour. The members requested the Secretary to forward their best thanks to Herr Rirfelder for his friendly gift.

Herr **Hermanu Soop**—a gentleman known in Germany as a first-class photographer—said that these landscape pictures were the most excellent and artistic works he had ever seen.

Herr T. U. Renettendorff exhibited a fine collection of lichtdrucks, by Herr W. Hoffman, of Dresden.

The meeting was shortly afterwards adjourned.

Correspondence.

Meeting of the Photographic Society of France.—Printing in Fatty Ink Upon the Negative.—The late Mr. Fox Talbot.—Photography and the late Philadelphia Exhibition.—Useful Application of Photography.—Experiments with Emulsions.—M. Janssen on Solar Photography—The "Oroheliograph."

The usual monthly meeting of the Photographic Society of France was held on the 7th inst.,—M. Peligot, member of the Institute, occupying the chair.

After the election of three new members, M. Perrot de Chaumeux read a letter from M. Rossignol upon actinism, and presented, on the part of M. Gauthier-Villars, two of his new publications.

Amongst the extracts read from the photographic journals attention was drawn to the process of printing in fatty inks upon the photographic negative itself. A film of albumen is first put on the glass, which is then collodionised, exposed, developed, fixed, and washed, and whilst in a wet state a solution of gelatine and bichromate of ammonium is applied and dried in the dark. This negative is exposed with its back to the light, which, traversing the image on the collodion, acts upon the gelatine. The time of exposure may be judged of by the appearance of the details in the gelatine of a brown, sepia colour. This is then washed in cold water until the film contains no trace of the bichromate. The surface of the gelatine is now covered by a roller with lithographic transfer ink, and sponged with a solution of gum arabic and a small quantity of ox-gall. The photographic negative is thus transformed into a plate, which can be printed from like a lithographic stone or transferred thereto, and offers features of great importance to photographers and lithographic printers, so long as the process is confined to drawings and line work. It is used in the National Heliographic Establishment of Portugal. This process has, I believe, been patented some years in England and in France.

M. **de Chaumeux** said that, having been charged by the committee to draw up a notice of the life and works of the late Mr. Fox Talbot, he must apologise for the delay in presenting the same, which was caused by his official duties. He then offered for acceptance a well-merited mark of respect to the memory of one of the oldest of the honorary members of the Society, and of a great man who had quitted the scenes of his highly-valuable, accomplished, varied, and scarcely-estimated labours, for, as M. Davanne remarked, he had endowed the world with the negative.

M. **Peligot** thought the reporter had not dwelt sufficiently on the previous labours of M. Niepce, who, M. Davanne affirmed, had been kept in the background, and as much out of sight as possible by Daguerre. [M. Daguerre, it must be remembered, received a public recompense from the French nation, so that the publication of his discovery might be from "France, the centre of civilisation, an offering to all the world;" but he first took steps to secure a further pecuniary interest by taking out a patent in England—a measure which was not anticipated when he received the national grant of his own country!]

The report of the Philadelphia Exhibition was presented to the Society.

M. **Davanne** was glad to observe in it that, for the first time in his recollection, photography was officially ranked amongst the fine arts, which he considered was fairly due for the artistic qualities displayed by many of its professors.

M. Taillefer—one of the judges at the Palace of Justice—expressed pleasure in exhibiting one of the useful applications of photography. During the arbitration cases arising from the appropriation of an immense amount of private property for the public service, called "public expropriation," to enable the municipal council of Paris to make the new boulevard from the grand opera down to the Palais Royale, a large number of claimants for compensation produced, to strengthen their cases, photographs of their respective properties. Those especially whose value was increased by their number of customers—such as owners of *cafés*, public houses, and retail shop keepers—had secured instantaneous views with numbers of people figuring therein, giving life and scale to the proofs; also photographic copies of architects' estimated plans and elevations of buildings to replace those taken for public utility. These photographs had been of much service to the jurymen by permiiting comparisons to be easily made, and to be referred to by judges and counsel. Compensations of £40,000 to £160,000 having been awarded, and land sold up to £50 a yard, it will be seen that the cases were of vital importance, and that photography did serviceable duty.

M. Audra said that the two proofs which he presented would be sufficient to show that his plates, by M. Chardon's emulsion process, preserved their sensitiveness during long and trying voyages. He prepared the two plates on August 1st, and entrusted them to the care of Commandant Rapatel, of the steam-ship *Yang-tsee*, who exposed one of them at the Palace of Saigon, on the 12th September, and the other on the porcelain tower at Shanghai on the 9th of October. These plates were simply kept in a grooved plate box, varnished on the inside with ordinary alcoholic negative varnish, the air having easy access to it, in contradistinction to the experiment made in a soldered zinc cover, when the outer atmosphere being at a higher temperature than the interior may have caused a condensation of air in the case, and so have affected the result of the experiment. [See page 586 *ante.*] The box was returned to him on the 3rd of December, and he proceeded at once to develope the two plates, which were successful, under the usual normal conditions. During this voyage the temperature mounted up to 140° Fah., and at certain periods of time the humidity of the atmosphere was excessive. During the exposures the sun was covered with clouds. The symmetrical lens of M. Prarmoski was used with the third stop for one and a-half and two minutes, which was too much by half. Owing to the kindness of Commandant Rapatel, M. Audra is making some additional trials, in the course of which the plates will be subject to a temperature of from 110° Fah. to 18° to 25° below zero, and of which he will give an account next April.

M. Chardon added that, thanks to M. Audra, he was also enabled to send out some plates which were packed up in an ordinary plate-box. The exposures were made in the dry-plate camera and changing box of M. Jonte, but were unfortunately one-third too much; the *clichés* were otherwise good, and the parts concealed during exposure by the frame enclosing the plate were as perfectly transparent as glass. One of the plates he observed with the magnifying glass had a number of very small and fine points, but perfectly clear of any other defect; these he attributed to dust in the packing or changing box, but the operator of M. Janssen said the small round points were caused by the action of the sea air. He had himself experienced this defect during the voyage of the French mission to observe the transit of Venus. He had pleasure in stating thut he had exposed dry plates sensitised in the silver bath and developed them with perfect results on his return to France. These had been kindly supplied to him by Professor Stebbing, who recommended his clients to buy the washed emulsion in powder, and to dissolve it as their necessities required. This was the safest way; for dealers kept emulsions in their shops a long time, and as the bromide of silver deposed at the bottom of the bottle, it was exceedingly difficult by agitation to restore the solution to its primitive state of excellence. He thought emulsion was better a week after its solution than at the time of its preparation.

M. Janssen said that when he had last the honour to appear before the Society he stated that photography would enable him to make records of the sun, and might be the means of making important discoveries thereon. He could now corroborate that statement. He communicated a first result of the studies which he pursued by the aid of the photographic solar proofs of six inches in diameter, upon which he had succeeded in obtaining details which measure but a small fraction of a second. He would not stop to speak of the granulations which these proofs showed on the surface of the sun, but should return soon upon the point which touched the question still debated—the form and dimensions of the last elements of the photosphere. An attentive examination of the prints showed that the surface of the photosphere had not an uniform constitution in all its parts, but that it divided itself in a series of figures more or less distant from one another, and presenting a particular shape. The outlines of these figures were more or less rounded—often nearly rectilinear, but most ordinarily resembling polygonal forms. They are very varied; they obtain sometimes one minute of diameter and sometimes more. In the intervals of the figures of which I have spoken the grains are sharply defined and well terminated, although of sizes varying very much, while in the interior the grains appear half effaced, lengthened out, and deformed, as if by a great commotion, and frequently they disappear, their place being occupied by currents of matter instead of a granulation of surface. All this indicated that in those parts the matter of the photosphere had experienced violent movements which have confounded the granular elements. He would not allude at present to the consequences of that fact, which showed the forms of solar activity, for he had already said some time ago that this activity in the photosphere was always very great, although it did not show any defect on its surface. The surface formation of the photosphere cannot be discovered by any visual optical means directed at the sun. In fact, to see it upon the photographic negative it was necessary to employ magnifying glasses which comprise a certain extent of the photographic image. Then when the enlarging powers are well chosen, and the proof is very pure, and especially if the negative has received *the exact exposure necessary*, it will be seen that the granulation is not everywhere of the same sharpness and definition, and that parts where the grain is well defined shows like circuitous currents which surround the spaces where the phenomena have the aspect described. Now to establish this fact, it is necessary as he had said, to embrace a considerable portion of the solar disc, which is impossible to do when the sun is examined with a very powerful instrument, the field of which is from the fact of its power very limited. Under these conditions it can very well be seen that there are portions where the granulation ceases to be sharp or even visible, but it is not possible to conclude from this that it is part of a general system. He would add that, as to the photographs themselves it was necessary to study several negatives to be sure, in a general manner, of the *réseau* or formation of which he spoke. It was thus during a visit that Dr. Warren De la Rue was good enough to pay him at Mendon, on the 27th October, that he was struck during the examination of one of the photographs with the magnifying glass, and stated that there was a space where it appeared as if the granulation was effaced, and in its place evident traces of very violent movements. With his great ability in these questions Mr. Warren De la Rue recognised the importance of this fact, and M. Janssen was able to show him, in corroboration of his opinion, on several the photographic proofs of this series that the phenomenon was very general, and *was* a part of the system of which he had just spoken.

M. le Commandant de la Noë presented a curious looking panoramic instrument, which he called "Oroheliograph." In a few words, it consists of a camera, the place of the ground-glass forming the base, and the lens looking up perpendicularly to the sky. Over the lens is placed a silvered mirror, half-globe shaped, completely circular on its plan and parabolic through its vertical section. The result is that an image of all surrounding objects reflected from this half-bull-shaped mirror is received by the lens always in focus thereon, and transmitted thereby upon the sensitive plate underneath, with its surface forming a right angle with the axis of the lens and circular mirror; by this means a circular panoramic view of the horizon is obtained, as seen from the station the oroheliograph occupies. The instrument shown to the Society is the first rough model, and the proof exhibited showed some astigmation which would be corrected. The vertical lines are true and sharper than the horizontal ones; this is caused by the use of a defective reflector silvered on the exterior, which will, however, be obviated. The curves were calculated by Colonel Mangin of the Engineers. The instrument is considered of value for military reconnaissances, and the angles and heights can be measured from the views taken at two or more stations. W. Harrison.

Asnières (Seine), Paris.

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REMOVAL OF SOLUBLE SALTS FROM GELATINE EMULSION.

To the Editors.

Gentlemen,—My attention has just been drawn to a request from a correspondent, signing himself "Gelatine" in your last week's Journal who asks of me information as to the best mode to eliminate the useless salts from a sensitised gelatine.

In reply I beg to say that, in a small way, he cannot do better than follow the plan he is now adopting for the purpose. Why he should have more water after the washing than sufficient for the purpose of completing the emulsion is owing to his using too much to begin with. This, however, is easily remedied by evaporating it to a proper consistency for coating the plates.

In my own practice, where I have to deal with large quantities I have to adopt a different plan, and it takes me only a fraction of the time to thoroughly get rid of all free salts from two hundred or three hundred ounces of the sensitised gelatine than it does to get them in; fortunately, the larger the batch, up to a certain amount, the quicker I can operate on it.—I am, yours, &c., R. Kennett.

8, *Maddox Street, W., December* 8, 1877.

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FERRO-PRUSSIATE PAPER.

To the Editors.

Gentlemen,—Your correspondent in Paris writes as follows in your Journal of the 7th instant:—

> "That cheap and useful adjunct to the studio and *atelier*, ferro-prussiate paper, is still further to be improved; for M. Pellet has discovered a way of printing the details of architects' and engineers' plans, designs, and writing, directly in blue on a white ground, the paper now made and supplied to the profession printing the subject in white on a blue ground. I hope to be able in my next communication to give all the details of M. Pellet's new preparation and manner of operating."

This improvement, alluded to as being about to be introduced by M. Pellet, has already been achieved by ourselves some months past, and the paper offered for sale.

We beg to hand you herewith a sample print and a circular, giving prices and mode of working.—We are, yours &c., Marion and Co.

[The sample print attests the excellence of the results attained.—Eds.]

WILL THE PHOTOGRAPHS EXHIBITED IN 1877 SHOW QUALITIES OF PERMANENCY IN 1878?

To the Editors.

Gentlemen,—The past photographic exhibition having been so satisfactory in point of numbers and general excellence, many suggestive thoughts occur, some few of which may be named for the consideration of exhibitors themselves. Observations were made which I have not seen in reviews of the exhibition :—1. As to the general *harmony* of the pictures with each other. 2. The massiveness of *tone;* it seemed to force exclamations from visitors at the depths of toning. 3. It was frequently remarked that the photographs were much more deeply toned this year. Persons had their attention directed to the exhibits, even to the works of those artists whose aim is supposed to be to have a light and constant style; these seemed also to have a tendency to depth. One is tempted, therefore, to inquire whether the producers, by a conscious view of exhibiting, gave more force than usual to their productions. The fact, however, was that many of the pictures—perhaps the majority—were so deeply toned as to show very great uniformity and harmony, with great force of tone and colour. Those who might prefer rich brown photographs had all gradations, to rich claret, chestnut darkness; and exhibitors who preferred *cool greys* came strongly out by contrast, while tending in tones and vigour to blackness, as if the photographs were to vie with engravings.

It becomes a fair question whether the tendency to darkness and blackness in many carbon subjects may not have influenced, perhaps quite unconsciously, the production of deeper-toned silver prints for exhibition, and this *fashion*—if fashion there be—in the rich hues of the productions shown this year.

It is just such questions as these that, I presume, give peculiar value to exhibitions, and if fashion prevails, then true estimates can only be formed by comparing works produced by different persons in situations where there can be no strict identity of light, periods of time, chemicals, modes of working, and display.

Having thus named this one point of the obvious intensity of these photographs, there comes the ever-recurring ideas as to their permanency; and I suggest whether some interesting facts may not result from watchful care, and examination from time to time of these exhibited pictures, and even to report at given periods on their permanency, or their changing, or their decaying state—say within a year from the date of their production or of exhibition. There appears to be a natural desire to know if these carefully-prepared pictures keep their pristine brilliancy and vigour, or if they show the sickly symptoms that perplex and sadden the photographer and the philosopher.

Of hundreds of valuable pictures prepared for exhibition the history must be well known; every point has been considered, estimated, and, it may be, well remembered. It will be gratifying, indeed, if the ready report can be made that they remain permanent, or that any changes may have traceable causes assigned. As there were hundreds exhibited so there may even be hundreds more that were prepared for exhibition, and these also afford ranks of witnesses to the effects of time and other influences on their existence and pictorial value.

In the exhibition I saw no glaring case of tendency to fade; if any such are known to the artists, then, comparing such appearances with the date of production, known only to themselves, it will be in the power of the photographers to furnish profitably a report on the pictures. I presume that the photographic societies and the photographic journals will readily be available for such reports on the pictures. It will be a grateful epoch in history if, after all the literature of doubtful value on the *fading* of photographs, there should by improved practice be the happ yresponse that the silver prints and pictures are but little changed, are good, or remain permanent, that were prepared for the London exhibition of the Photographic Society of 1877.—I am, yours, &c.,

December 10, 1877. Thos. J. Pearsall, F.C.S.

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EXCHANGE COLUMN.

A Dallmeyer's No. 1 triple achromatic lens offered for a rapid rectilinear, $1\frac{1}{4}$ diameter; difference adjusted.—Address, G. Bremner, photographer, Banff, N.B.

Weston's *carte* burnisher offered in exchange for $7\frac{1}{4} \times 4\frac{3}{4}$ or $6\frac{1}{2} \times 4\frac{3}{4}$ bellows body camera, with swing back and folding tail board; difference adjusted.—Address, John Geddes, Applegate, Arbroath.

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ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

S. Fry.—Received.

Boz.—The letter has been duly forwarded.

L. C.—Blotting-paper acts by capillary attraction.

G. S W.—A better way for studying posing than that which you suggest is to obtain a series of portraits of a high character and study them carefully.

Trade Catalogue and Lantern Readings.—We have Received from Messrs. Millikin and Lawley, 168, Strand, their *Lectures for the Magic Lantern*, and their *Trade Catalogue.*

J. Cockburn (Darmstadt) says—" May I beg you again to ask in your Journal if any one can give me the formula for bath and developer for sub-nitrate of mercury? Also what collodion I should try."

G. Lord.—A good lubricator for using with a burnisher consists of a very weak alcoholic solution of Castile soap. The publication of the articles respecting which you inquire will be a subject for further deliberation.

Anxious Inquirer.—Upon referring to the gentleman named, we have been informed that he invariably employs the acetate toning bath, and that the warmth or coldness of the tones of his pictures depends entirely upon the extent to which he allows the action of the toning bath to proceed.

C. C. W. (Leeds).—We are not aware of any treatment by which bromo-iodised collodion that has been decomposed by long keeping can be restored to its original excellence, or anything nearly approaching that quality. It is quite easy to render it entirely *colourless*, but this will not restore the sensitiveness.

George S. Smith.—The chief fault of the negative is its thinness. Intensify by means of bromide of copper, followed after washing by the application of a weak solution of nitrate of silver. The bromide of copper may be prepared by mixing together solutions of bromide of potassium and sulphate of copper.

Auxiliary Exposures.—We have received letters on this subject from Signor Scotellari, Mr. Currey, and others; but as we do not think it would be for the advantage of the contending parties, or for the benefit of our readers, that more should be said upon the special phase of the subject upon which they write, we must, in all kindness, ask these gentlemen to be good enough to excuse us from publishing their letters, which would raise issues that would be interminably protracted. Sufficient has been said on both sides.

C. H. Evans.—The fault undoubtedly lies in the distilled water, which must have been contaminated with some kind of organic matter. By treatiug it in the following manner it will work quite well, and give beautifully-clean negatives:—Add carbonate or oxide of silver until the acid has been neutralised; then, having poured the bath solutions into a flat dish, expose to the sun for two days. This will cause a black precipitate to fall, and after filtering add enough nitric acid to slightly redden bitmus paper, when it will work cleanly and well.

An Old Friend.—The subject of the desensitising of collodionised plates by treating them with a solution of iodide of potassium was first introduced by Professor Himes, who described his experiments about twelve years ago in The British Journal of Photography. Based upon what was discovered by this gentleman was a process for preparing plates in daylight, desensitising them by the iodide, and, after washing, restoring them to their original sensitiveness by treatment with tannin. In this way we have prepared sensitive plates in a garden during the course of the afternoon of a bright summer's day. This principle may be rendered exceedingly useful in such a case as that of the accidental exposure to light of a box of sensitive plates.

Received.—W. W. A. (Banff.) In our next.

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Serious Fire in a Photographic Studio.—We regret to have to record another disastrous fire in a photographic studio, this time in one of the leading establishments in London—that of Messrs. Lock and Whitfield, 187, Regent-street, whose premises are fitted up in that highly-ornate style becoming an establishment frequented by the "upper ten," and which extend from the first floor to the top of the building. This establishment was, on Wednesday evening last, discovered to be on fire, and the flames belching out of the upper windows spread consternation in that very busy thoroughfare; upon the arrival of the firemen they endeavoured to confine the ravages of the fire to the top floors by breaking through the ceilings below and plying their hose through the apertures thus extemporised. In this they were successful, and the fire above was eventually got under, a deluge of water, as may be supposed, flowing down the stairs in torrents. There were two glass rooms, both of which have to a great extent been destroyed, and of their fittings nothing now remains but charred fragments. This also applies to the dressing and other rooms. When making a cursory inspection the other day we saw large and once perfect cameras now converted into charcoal; lens flanges burnt off the wooden fronts to which they had been attached; costly furniture in black ashes, and, worse than all, the remnants of exquisite art productions, embracing many portraits of members of the Royal Family. A cupboard in which the lenses were stored has almost escaped, and, what is of far more consequence, the great bulk of the negatives are still intact, for the simple reason that they are kept in the Ealing printing establishment belonging to the firm. It is impossible as yet to assess the damage done. Already arrangements are being made to effect a reconstruction of the glass rooms in the most approved style. It is a matter of congratulation that we can record the fortunate escape from destruction of numerous works of art, consisting of portraits and miniatures of so high a class that even the finest miniatures in the national collection at South Kensington are not superior to them.

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Improved Vulcanised Rubber Stamps.—No photographer should be without one or more of these stamps for printing his name, &c., on the back of cards, mounts, envelopes, post wrappers, &c., &c. These stamps are very durable, and give a clear and sharp impression equal to printing. Each one is neatly fitted in a mahogany box, with pads and bottle of ink (any colour—red, blue, violet, black, &c.). Prices from 5/- free by post.—The Rubber Stamp Co., 15, Holborn Viaduct, London, E.C.—*Advt.*

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 920. Vol. XXIV.—DECEMBER 21, 1877.

ON PAPYROXYLINE.

Now that the preparation of pyroxiline suitable for various photographic purposes, but more especially for emulsion work, has again become a matter of current importance, we think the moment opportune for a brief notice of one form of that substance which appears to be but little known or favoured in this country. We allude to papyroxyline, or pyroxyline made from paper instead of from cotton; and, though not strictly coming under that head, we shall include with it the product obtained by the treatment with nitro-sulphuric acid of linen and other fabrics.

It is to our mind somewhat singular that though so little used here (for beyond an occasional mention in connection with emulsion experiments we do not know that it has come into use) it is largely manufactured on the continent, both in Germany and France, and applied to various purposes in connection with the practice of photography. Doubtless the exhaustive researches of Hardwich, to which English photographers pin their faith, have something to do with this result; for we believe that that gentleman decided by careful experiment that a more uniform and generally useful product was obtained by acting directly upon the raw material; and that uncertainties introduced into the manufacture of paper, linen, or cotton fabrics led to irregularities which rendered those materials unfit to form the basis of so important an item in our list of *matériel* as pyroxyline. However this may be, it must be borne in mind that fashions and processes have greatly changed since those researches were made; the almost universal adoption of bromo-iodised collodion, the introduction of bromised emulsions, and the production of an entirely different class of negative form some of the causes which have combined to render necessary an entirely new character in pyroxyline.

In the abstract it may appear immaterial what is the nature of the material used, whether raw or manufactured, provided it be cellulose in a state of at least approximate purity; but when we consider how widely different is the action of the acids upon different samples of even raw cotton, it is not surprising that a still wider difference should result when the raw material has passed through various stages of manufacture. The physical change which must be induced in the cellulose by the various processes that linen and paper have to undergo during manufacture, and the altered forms in which it is presented to the mixed acids when those substances are employed, are alone sufficient to render probable a widely-different product, and that probability is considerably strengthened by the change in the condition necessary in the manufacture of paper pyroxyline.

Indeed it is needful to set aside almost entirely all preconceived notions as to temperature, strength of acids, and time of immersion when any of the materials we refer to are used. Thus a temperature which would be considered excessively low for raw cotton is sufficient to entirely dissolve most descriptions of paper; the quantity of water permissible is scarcely less altered in quality. As regards the time of immersion: whereas, with cotton a few minutes suffice to complete the action, and any increase is detrimental to the quality of the product, paper, and more especially linen, requires an immersion frequently extending over hours. Further: the gain in weight of the product—a matter of paramount importance when cotton is employed—would appear to be of less moment with paper; for, though generally much higher—frequently as high as sixty or seventy per cent. in good samples—we have occasionally found it as low as only ten.

These statements apply generally to all manufactured material, though, obviously, they will vary according to the nature of the individual sample. In an extended course of experiments we have operated upon various descriptions of paper—from the finest tissue, or silk paper, to the thickest blotting, such as is employed for drying prints—and in woven materials, from thin cambric to thick, twilled calico. As a general result of these trials we may state that in proportion as the material improves in fineness and quality so does the treatment approximate to that usual with raw cotton; while, on the other hand, the coarser and thicker materials require correspondingly altered conditions—lower temperature, stronger acids, and longer immersion. It is scarcely possible in a short time to decide which of the various fabrics offers the greatest advantages. We have secured good results with nearly all; and, in saying that, we wish to convey that we have recognised special features not usually met with in ordinary pyroxyline. Our chief object has been to secure a pyroxyline suitable for emulsion work; and in this we have secured the greatest success with ordinary white blotting-paper—not the coarse "drying boards," but a good quality of medium thickness. We shall proceed to lay before our readers two or three formulæ which appear to us the best out of a considerable number.

Perhaps *the* best result we have secured, as showing good "all-round" qualities, is from the following formula:—

No. 1.

Sulphuric acid, s.g. 1·843	3 ounces.
Nitric acid, s.g. 1·42	2 ,,
White blotting-paper	145 grains.

Temperature, 100°; time of immersion, three hours.

The temperature (100°) is the highest which can be safely adopted without partial solution of the paper; and, though low in comparison with ordinary formulæ, we have not been able to use much higher with any of the materials we have experimented upon. The absence of water from the formula is also noticeable when taken in connection with the strength of the acids (which, we may remark, is the actual strength as taken by ourselves). The time of immersion is the shortest which will thoroughly convert the paper. It may be increased if desirable, but the only effect it appears to have is to make the product dissolve *more rapidly* in the ether and alcohol; if it be shortened a partially-insoluble pyroxyline results. The increase in weight of this sample was 61 per cent., the result weighing 240 grains.

We may notice that the products obtained from thick material, whether paper or linen, dissolve very slowly, sometimes requiring as much as an hour for complete solution; but if the immersion have been long enough a perfectly clear collodion is formed with little or no residue. This with ordinary pyroxyline is not usually considered a good feature; papyroxyline, however, differs in this respect, the thicker sorts swelling like gelatine and forming a transparent jelly before passing into solution. This particular sample required only about five minutes for complete solution. We omitted to state that the temperature given above is that at which the thermometer stood at the commencement of the immersion, no note being taken of it afterwards.

In the preparation of the next sample the cold acids used in the last operation were freshened up by the addition of one ounce of nitric acid, which raised the temperature to 85°; a second quantity (of 145 grains) of paper was immersed for three hours and a-half. This last feature—the re-utilisation of the acids a second or even a third time—is, if not peculiar to paper pyroxyline, at least more capable of adoption than with cotton. We have passed three successive batches of material through the same acids, without, as in this case, an addition of fresh acid; and the results were in no way apparently inferior, though necessarily different in character. The chief difference in this instance was a greater length of time in dissolving in the mixed ether and alcohol, the collodion being equally clear and free from sediment. The increase in weight we neglected to note, but we believe it was greater than in the preceding case.

A third formula we mention to show the effect of weakening the acids, though part of the effect may be due to a slight decrease in the proportion of sulphuric acid.

No. 3.

Sulphuric acid, s.g. 1·843	2 ounces.
Nitric acid, s.g. 14·2	1½ ,,
Water	½ ounce.
Blotting-paper	120 grains.

Temperature, 90°; time of immersion, two and a-half hours. There were traces of partial solution of the product, which would probably account for a diminution in the percentage of increase of weight, which barely amounted to forty per cent. The pyroxyline in this case was very slow in dissolving and left a good deal of sediment; but the filtered collodion was thinner and apparently possessed greater fluent properties, drying into an opalescent film, without, however, showing any appearance of structure.

In general physical properties the following differences were exhibited by the respective collodions:—No. 1 was most free from structure, and showed the least tendency to run in lines, No. 3 coming next. In toughness Nos. 1 and 2 were about equal, No. 3 being "shorter" and less tenacious. No. 2 exhibited the greatest tendency to leave the glass, No. 1 being much more adhesive; while No. 3, even after drying, would permit a strong stream of water to play on it without, for some time, showing any inclination to move. The working properties we must leave to a future article, our space this week being nearly filled. The photographic qualities of these and other samples are, we may say, very good.

In conclusion: we have no reason to regret having undertaken the examination of the properties of papyroxyline. Our experiments have sufficed to prove to us that it is capable of playing a very valuable part in emulsion photography, and, we believe, will solve the problem of that desideratum—a pyroxyline which, while giving density, is capable of resisting the action of water in washing or precipitating.

AN IMPROVED OXYGEN RETORT.

When the history of the lime light comes to be properly written it will be found that to the ingenious men of Manchester must be credited many improvements which have conduced in no small measure to the perfection and simplification of this light. To the members or friends of the Manchester Photographic Society the public is much indebted for valuable suggestions, hints, and elaborated results of experimental skill in this department of artificial light; and, speaking for ourselves and a few friends—connoisseurs in "light" science—we cordially express our obligations to them.

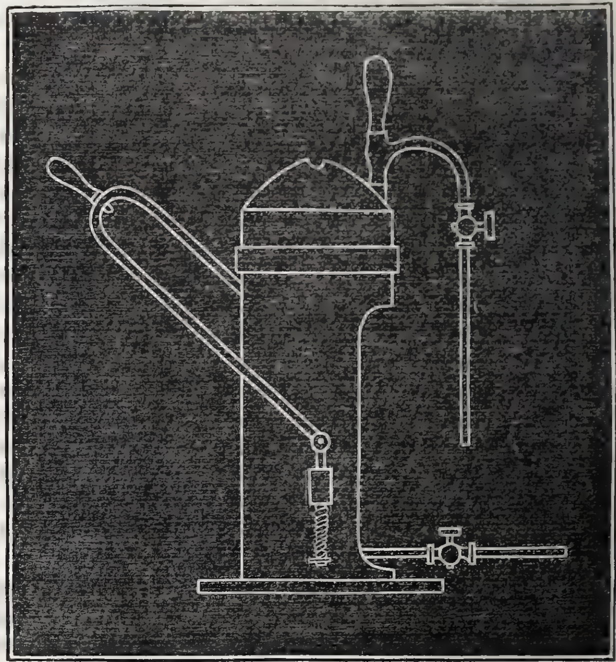
It is now our privilege to describe another piece of apparatus in connection with the lime light, and which, too, hails from "Cottonopolis." It has already been twice exhibited in public—once at the Manchester Photographic Society, and, more recently, at the technical exhibition of the South London Photographic Society. The interest displayed on the latter occasion has led us to give a detailed description of it for the benefit of our readers.

Chadwick's retort—introduced and manufactured by Mr. W. J. Chadwick, of Manchester—is intended for use with gas, for which purpose it is fitted with an atmospheric or Bunsen gas burner. It consists of a cast-iron tubular stove, about six inches high by three and a-half inches in diameter. There is an aperture in one side of large dimensions, extending nearly from the top to the bottom, and in this opening is inserted the atmospheric gas burner, which is firmly screwed to the bottom, the flame playing against the top of the little stove, which is quite flat and somewhat thin. Fitting closely over the flat top is a cover about two inches high, in the upper side of which is a brass pipe, closed by a stopcock, for conveying away the oxygen as it is formed. This cover is fitted with such a degree of accuracy, by means of turning, that when it is *in situ*, and retained in its place by means we shall presently describe, it is practically gas-tight.

The oxygen mixture is provided in the form of little thick cakes, of dimensions which might be fittingly compared with those of a small halfpenny bun, or with the cap of a quarter-plate lens. Of the composition of these cakes we shall speak hereafter.

When a cake has been laid upon the top of the retort, the cover is placed upon it; but here we leave the cake for a few minutes in order to describe the means by which the cover is retained in its place. On opposite sides of the retort are cast projecting ears, through a hole in each of which passes a short, stout brass rod, the length being about two inches, and the thickness rather under that of the little finger. A stiff, spiral spring acts between the lower surface of the projecting piece and a cap on the lower end of the rod, which is thus kept pulled downwards. To the upper end of each rod is hinged one of the limbs of a long U-shaped piece of brass of considerable strength, and of a length sufficient to enable it to be brought right on the top of the retort cover, upon which it presses with a degree of force commensurate with the power of the spiral springs, which, as we have said, always pull in a downward direction. A slight hollow in the top of the retort, and a projecting point in the loop of the brass U, serve to ensure the retention of the latter in its place.

The accompanying diagram shows the various parts described.



The cake of oxygen mixture having been placed upon the top of the retort, and the gas-burner underneath being lighted, the cover is immediately put on, and the brass U, by means of its small projecting wooden handle, pulled over it so as to ensure its being clamped. The oxygen will soon begin to pass off, when it must be conveyed into the reservoir or bag in which it is to be stored by means of an india-rubber tube. When the cake has parted with all its oxygen the cover is taken off, the exhausted cake removed, and a fresh one put in its place ready for giving off its oxygen whenever the gas underneath is lighted.

From what has been said it will be seen that, to those who have a supply of oxygen cakes beside them, the manufacture of oxygen is very simple. Care must, of course, be taken to keep the exit tube clear; but, even if it were completely choked, or if the tap were turned so as to prevent the passage of the gas, no explosion from pressure could take place, because the sole effect of a greater accumulation of gas than could be conveyed away would be the raising up of the lid of the retort as soon as the pressure of the gas overcame the tension of the spiral springs by which the oxygen would be allowed to escape.

The tap and the various handles are formed of wood, the non-conducting powers of which permit the apparatus to be freely handled when hot.

The cakes are formed of three parts of chlorate of potash to one part of black oxide of maganese, a very small proportion of gum water being added to that with which the ingredients are moistened previous to their being pressed into the mould by which they are shaped.

ARTISTIC "PROPERTIES."

When a painter sits down to paint a picture he is commonly supposed to draw and colour it entirely from memory or by virtue of his artistic insight, or is thought to adopt the usual phrase, "to do it out of his head;" but that such is not the case our readers will scarcely need to be told.

Anyone who has the *entrée* into the sanctum of a successful artist can tell of the numerous accessories, dresses, shawls, and other draperies, bits of artistic furniture, and the thousand-and-one things that go to make the pictures from the well-known hand. Does he want a portrait of a hussar in full uniform, he straightway sends to the costumier and hires a complete attire, and clothes his model in them. Does he wish to paint a fair lady in a special historical dress, he forthwith engages a first-class dressmaker to make one exactly to his instructions. We know a very popular picture to obtain the lady's dress for which cost the artist close upon twenty pounds. And all this *ad infinitum.* Whatever he imagines, he, in almost every case, draws or paints direct from a model before him, or, what is the same thing, from a sketch previously taken from a model. And, again: although no studio is complete without a huge, life-size, jointed, wooden doll (the lay figure) on which on occasion to hang clothes or display a piece of head-gear, the majority of sketches are taken from the living model, the bill for whose services forms a heavy item in his periodical disbursements.

There being so many art-students whose means do not enable them to compass the use of any special dress—who have to be content with what they meet in modern life in making studies or composing pictures—we make the suggestion that a complete series of well-taken and accurately-focussed photographs so as to obtain all details of various costumes as found in numerous places, museums, and at the well-known depôts for what are termed "costumes," would be of great use, and likely to have a considerable sale. It might be expected that a demand would be created not only among artists but among the public generally, more especially at this time when private fancy-dress balls are so fashionable, and everybody is searching in all kinds of out-of-the-way places for old pictures with dresses quaint or archæological in style.

The fact of the employment of the artistic furniture we have alluded to being so well known, it might be thought a little hard upon photographers that their employment of properties suited for their own purpose should have been so often decried and ridiculed; but in too many cases the ridicule has been well merited, and we purpose briefly to comment upon the gradual revolution that has taken place. Before the advent of *cartes de visite* few full-length pictures were taken, and the want of something to fill up bald spaces of background was not felt; but when the new style became, as it did and so suddenly, a rage, the natural artistic instinct that most people possess, more or less developed, rebelled against the empty monotonous patches of wall space depicted, with nothing beyond a thin-legged chair and a plain table to break its monotony, and a reaction set in, resulting in the production, in the first place, o well-designed scenic backgrounds by a few good men, which were copied and elaborated *ad nauseam,* till every fifth-rate photographer in the kingdom possessed at least one.

The result we all know. Everything possible and impossible under the face of the sun was painted and put behind the sitter; not the slightest idea of either artistic or personal keeping prevailed in a multitude of cases. The result was a dreadful parody of art—far worse than the first tame flatness of empty walls it was originally intended to displace, Concurrently with these background vagaries judgment ran riot in the matter of furniture. Chairs and tables of the most magnificent descriptions, gorgeous fringing and carving such as was never seen even in the mansions of the great, grew common, and the public rather ran after the photographer who gave most in the shape of furniture and backgrounds for their money.

It is not to be understood that we apply these remarks to every member of the fraternity. There have been all through cultivated minds whose correct taste showed in all their works, and they acted as artistic leaven, and the whole mass is quickening and has been quickening for some time. The taste of some of these minds lay in the direction at all times of plain or, rather, non-pictorial backgrounds, but sufficiently broken up by light and dark to avoid monotony. This is the very highest difficulty to overcome.

It is one thing to have a plain background of suitable depth of tone, but it is another to break it up in such a manner as to leave its masses of light or of dark to harmonise with the figure and the general arrangement of masses in the picture. When it is done successfully the highest results may be achieved. It is, however, we repeat, a task of extreme difficulty, but one that can always be aimed at with advantage.

We may be asked what we ourselves recommend—a plain or a pictorial background? We should reply that a background, plain or monotonous, is infinitely preferable to an ill-designed pictorial one, or even to one of the latter well designed but not in keeping with the subject or its arrangement; for, be it remembered, the background must not only harmonise with light and dark parts of the picture, but the lines of the one must also balance or be arranged in proper connection with the lines of the other.

It is not our practice to refer to trade productions; but in this connection we cannot but offer words of great praise for some new backgrounds which we have lately seen making their appearance—produced, we believe, in America. For artistic keeping, for general suitability for photographic purposes, and for the very high technical skill displayed in their execution, we have the warmest commendation. The ordinary accessories of the studio are beginning to show more artistic modesty, and the kinds usually adopted are far better than they have been, though in some very good studios there are still to be seen some highly-ornate pieces of furniture which would want an infinity of arrangement and counter attraction in a picture to avoid their appearing *offensively* obtrusive.

We advise every photographer, when making additions to these really necessary adjuncts of a studio, to select not on account of the absolute prettiness or elaborateness of the object, but to endeavour to answer to himself the question—"Is it real? Is it a piece of furniture likely to be seen in a gentleman's house? Is it likely to aid in making a picture without forming a sufficient picture of itself?" If he feel the object he is considering will allow of an affirmative reply he may safely employ it, though we venture to affirm that fifteen out of twenty things of the kind he is likely to encounter will cause him to shake his head and pass them by.

ON FOG-PRODUCING EMULSIONS, AND ON THE COLOUR OF EMULSION.

[A communication to the Photographic Society of Great Britain.]

During the discussion following my paper on *A Neglected Method of Intensification,* on April 3rd last, which appeared in the Society's journal, I incidentally mentioned my reasons for thinking that the effect of nitric acid in an emulsion as a preventive of fog was to prevent the formation of any chemically-produced sub-bromide of silver, or to reduce it all to the state of bromide; and that this sub-bromide might be produced by the fact that a sub-bromide of the metal employed in forming the basis of the emulsion might exist, particularly if it were a diad metal, such as cadmium. I had intended to go further, and to say that any small quantity of the oxide of the metal or of silver, or of the metal or silver, might act similarly. The action of the nitric acid would be to form nitrates with the oxides or metals, as also with a part of the sub-bromide, leaving bromide behind. Where really pure bromide is present, it seems almost impossible that there should be fog. I had also intended to show, as a natural corollary, that the action of copper bromide (or copper chloride) on sub-bromide of silver was to reduce it to bromide of silver together with sub-bromide (or sub-chloride) of copper; and that this sub-bromide (or sub-chloride) of copper could only exist after all the silver nitrate had been converted. On the 3rd of August an article by one of the Editors appeared in THE BRITISH JOURNAL OF PHOTOGRAPHY, in which that same opinion was given.

The article states:—"We shall now attempt to offer a rational explanation of the phenomena (the elimination of fog), and shall attempt to show that the action runs indiscriminately, whether a chloride, bromide, or iodide be employed, provided only the halogen be in combination with a metal which it has *a less affinity for than silver.*"* This law will be found to hold good in every case, I believe, and the explanation is to be found in my paper which I have already referred to.

The reaction there given is as follows;—

Silver + Copper Bromide = Silver Bromide + Copper Sub-bromide.

$$A. + Cu. Br._2 = Ag. Br. + Cu. Br.$$

We may now substitute for silver, silver sub-bromide, and the reaction would be:—

Silver Sub-bromide + Copper Bromide = Silver Bromide + Copper Sub-bromide.

$$Ag._2Br. + Cu. Br._2 = 2 Ag. Br. + Cu. Br.$$

For the bromide we might substitute the chloride, and for the copper we might substitute cobalt, gold, &c., and the same results might be supposed to occur.

As already stated, the silver sub-bromide might arise from an imperfect soluble bromide, or through a mixture of oxide or the metal with it.

Instead of these haloid salts of copper I have been accustomed to employ bromine or iodine, when evidently an equally effective reaction would take place.

I may mention that that indefatigable worker, Mr. Warnerke, first suggested to me the use of iodine, and since it is incapable of combining with alcohol it is perhaps safer to use than is bromine, which forms bromal.

Now what can cure, or perhaps I should say eliminate, the chance of fog which in an emulsion should be equally effective with a dry plate made as with an emulsion? and in order to demonstrate this to you tonight I have brought with me a series of transparencies all differently treated. I will, to avoid repetition, detail the way once for all in which every experiment, except one, was carried out. A 6 × 2 plate was coated with emulsion, dried, and then carried out into the light. One end of the plate was treated with the fog-destroying agent, and the whole then washed and dried. Next the plate was exposed behind a negative for a suitable time, alkaline development resorted to, and the usual fixing, washing, and drying carried out. The first plate I hand round was treated with copper bromide (the bromide being formed by the double decomposition of copper sulphate and potassium iodide, as detailed in my paper already referred to). You will see that there is no fog on the part treated with it; the transparency is perfectly clear. The next plate shows the result of the substitution of ferric chloride for copper bromide; the fog induced by diffused light is nearly entirely destroyed, though the plate is not quite so bright as the first. Bèchamp found that gun-cotton was reconverted into ordinary cotton when treated with ferrous chloride, and this, perhaps, may be the reason of the slight veil which is apparent.

The next plate is very instructive; the end was treated with potassium bromide—not for a short time, but for a considerable time. You see that the fog is scarcely at all destroyed, and, remembering that potassium is a monad element, we get a proof of what I have asserted regarding the necessity of the haloid being that of a diad.

The next plate is also interesting. You will notice that it is clear throughout, though if the experiment had been perfectly successful it should have been bright, with fog at one end. The reason of this failure is that the fog-destroyer used was bromine water, and the vapour of bromine escaping from the solution has been sufficient to undo the work of the diffused light. This experiment is similar to one made by Mr. G. Shaw with the daguerreotype plate, where he showed that the daguerrean image would be destroyed by the vapour of bromine.

The next plate was treated with a solution of iodine in alcohol. You see how effectually the destruction of fog has been accomplished on the end to which the iodine was applied.

The sixth plate I show was treated with dilute nitric acid. You will notice how perfectly bright it is where the acid has had access to the film, and I would here draw your attention to the marked difference in the behaviour of this film from that which would be observed with an iodide or bromo-iodide film.

With the two latter it is almost impossible to destroy the action of light. You may develope a plate by the ordinary developer, dissolve off the deposit with nitric acid, develope again (adding silver nitrate of course), and you get an almost equally strong image. This may be repeated many times, as I showed some years ago in a letter which appeared in the *Photographic News*. It seems to me that this may have something to do with the necessity of using a very acid bath with bromised collodion, if great freedom from fog be desired.

The seventh plate I show is one treated with dilute sulphuric acid. The end so treated varies in the freedom from fog; the clearest parts are those on which the acid was poured, and on which the acid was allowed to remain the longest.

The last plate is one not exposed to diffused light, but simply a fog-giving emulsion, one end of which was treated with copper bromide before exposure behind a negative; you see that part is comparatively bright.

I cannot help thinking that all these plates are very instructive; the action that has evidently taken place, viz., the reduction of the sub-bromide to the state of bromide, is most marked, and in this respect tends to prove the correctness of the chemical theory of the developable (let us rid ourselves of that misnomer, the "latent") image.

The results are before you. You can draw your own deductions from them; to me they speak volumes.

As far as regards theory and practice, I can see no reason why fog should ever be met with in pure emulsions—and when I say "pure" I mean emulsions in which there is no extraneous organic compound added. When such bodies as albumen and gelatine are added we may expect other results, as then we arrive at different conditions if the emulsions have been prepared with an excess of silver nitrate.

I have now to retract an opinion which I have previously expressed—I mean the opinion I held regarding the comparative fineness of division of the particles in an emulsion. I stated that the ruby-coloured emulsion was coarser than the blue tinted. Had I given it a proper amount of thought I should at once have seen that I was in error. The particles in the ruby-coloured emulsion were small enough to allow the larger wave-lengths (the red) to pass through them, whilst they were large enough to stop the smaller wave-lengths (the blue). With the emulsion which has a greenish tint by transmitted light the particles are large enough to stop some of the red, and widely enough distributed to allow the blue to pass mixed with a portion of the red, which, having been partly absorbed, pass through with diminished amplitude, and consequently with less intensity. The resulting general tint is, therefore, that of the shorter waves.

Mr. Berkeley's published experiments, in which he shows that when the greenish emulsion settles the top layer has a ruby tint, are very instructive. I have repeated them with the albumen emulsion, and have no hesitation in saying that he is correct in his views. The ruby-coloured emulsion is all pure silver bromide; the heavier particles which sink first are a combination of silver bromide and silver albuminate. Too much stress must not be laid on the difference between a bluish and a red film, *when we simply regard them in the light of a sensitive salt separated into coarse and fine-grained particles.*

In both films the particles must be in an extreme state of division, otherwise there would not be the distinctive colour; in fact, the size of the ultimate particles must be measurable on the same scale as the waves of light themselves. I cannot say more at present on the other effects that may depend on the colour of the film, as my investigations in this respect are incomplete.

There is no doubt in my mind that the albumen emulsion has a greenish tint, which I described to the Society in June last, and is more rapid than any I have tried. I offer a suggestion, which is that the organic salt of silver in the emulsion is the cause of the rapidity. The silver in combination rapidly takes up the bromine which may be liberated by the action of light on the bromide, and we have a film almost in the state of a wet plate, the organic salt of silver being substituted for the silver nitrate.

W. DE W. ABNEY, F.R.S.,
Capt. R.E.

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* It would have been more generally clear had the word "metallic" been placed before *silver*.

PRINTING AND TINTING FRAMES FOR THE CARBON PROCESS.

I now redeem my promise to send you a sketch of printing and tinting frames for carbon printing.

Fig. 1 represents the printing-frame with the back removed. It consists of a board in which are cut the apertures of the required size and form, the outside being well chamfered, the same as the ordinary printing-frame. Ribs are then placed on the back for elevating and carrying the usual springs and catches. The inside measurements of the frame are 16¾ × 4⅜, which allows of five negatives being inserted, one over each aperture, with one-tenth of an inch clearance between each negative.

FIG. 1. FIG. 2.

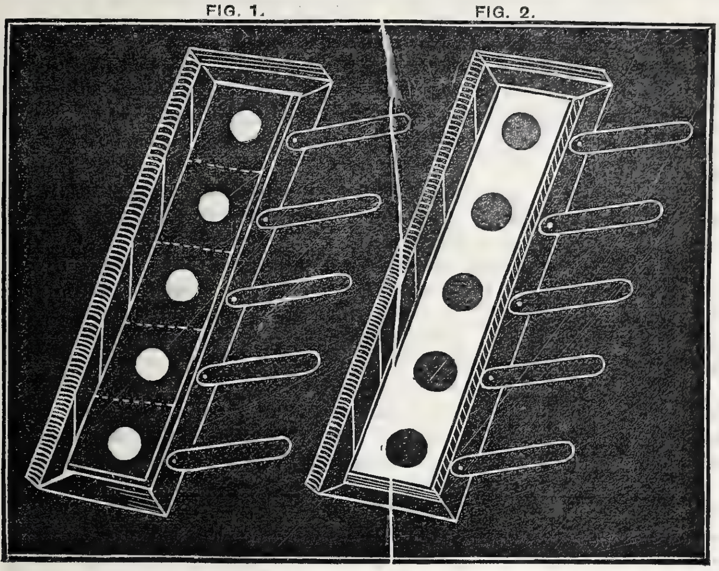

Fig. 2 shows the tinting-frame, of exactly the same size, with strong glass front, on which is placed the centre masks to correspond with the apertures of the printing-frame.

Fig. 3 shows the back, and *fig.* 4 the full-size elevation of the same. It consists of a sheet of india-rubber about one-eighth of an inch thick, 16⅝ × 4¼, on the back of which the pressure-boards are cemented. These are the same size as the negatives (4¼ × 5¼), and must be well-bevelled at the edges, as shown in the full-sized diagram, so as to allow them to turn back. There will be a space between the boards, the same as between the negatives, of one-tenth of an inch; and, with the ordinary springs and catches, the frame is complete.

FIG. 3.

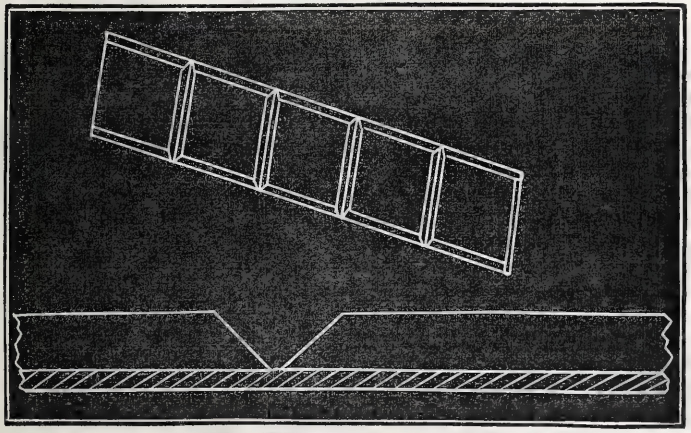

FIG. 4.

To work, I intend sensitising my tissue in pieces 8½ × 16⅝, cut from the roll to a wooden cutting template, so as to get the edges as straight as possible. After drying the pieces are again cut in two the narrow way, which leaves them 4¼ × 16⅝.

Having placed the negatives in the printing-frame, and arranged them to suit the openings, take the tissue and press up to the right-hand top corner, and secure with the first pressure-board (the others being turned back out of the way); then turn down the second, and so on to the other end. After printing, place in the tinting-frame, taking care to always press up to the same corner as in the printing. The frames could be made with more openings than five, but I do not think that they should exceed eight in number.

For setting the masks in the tinting-frame I recommend the following plan:—Take a piece of stout drawing-paper the size of the pieces of tissue, and place in the printing-frame as before directed; then with a fine pencil trace round the openings on the drawing-paper. Next take out of the frame and fix on the masks to the marks with a little dab of gum; and having covered the whole of the masks with gum place it in the tinting-frame, and allow to set for a short time. Finally take out the pressure-boards and damp the paper, and it will then leave the masks transferred to their exact position.

S. Bamforth.

ON SUBSTITUTES FOR COLLODION IN CARBON PRINTING.

[A communication to the Photographic Society of France.]

Glass, used as the temporary support in carbon printing, gives, from its fine surface, the most perfect and beautiful images, but it must be covered with a coating which will render more easy of manipulation the adherence of the exposed paper, the development, and the separation of the picture after the application of the permanent support. With wax alone as a coating it requires great ability to succeed in the development without tearing or abrading the image.

With collodion as a coating the manipulation is very easy, but it is expensive. Two pints will be required to cover fifty plates 12×10 inches; besides, the collodionising and complete washing until greasiness disappears occupies much time. I have found that it takes an active man eight hours to perform the above operations. It is, therefore, not possible to use this mode for cheap general work.

To avoid these inconveniences I have devised several other coatings for glass fulfilling the same office as collodion, but only costing a few pence each pint, and enabling me to prepare 480 glasses 12 × 10 inches in eight hours, and giving all the sharpness, beauty, and gloss the surface of glass as a temporary support can produce.

It seemed to me that these advantages were very important, and that is why I thus readily publish my formulæ, in the hope that photographers who use the carbon printing process will quickly appreciate the modifications I bring before them, and that they will lead to the process being universally practised by the profession.

Formula for Coating Plates.

Starch	20 parts.
Liquid ammonia	40 ,,

Digest for at least one hour, during which time a solution of—

White sugar	5 parts,
White soap	5 ,,

is dissolved with heat in—

Distilled water	500 parts.

Then mix.

Second Formula.

Dissolve with heat—

White soap	5 parts.
Liquid ammonia	25 ,,
Distilled water	250 ,,

In another vessel place—

Powdered gum arabic	5 parts.
Distilled water	250 ,,

Dissolve with heat and then mix together.

Third Formula.

Ox-gall	100 parts.
Distilled water	400 ,,
Liquid ammonia	100 ,,

Then make a solution dissolved with heat on a sand bath of—

White soap	¼ part.
Alcohol (36°)	25 parts.

Mix, and add twenty parts of albumen in water (made with the white of an egg beaten up with 100 parts of distilled water, reposed and drawn carefully off) and twenty parts of white sugar.

The first two formulæ give occasionally streaks in the film of a slightly opaline kind.

The third formula, on the contrary, produces a film completely limpid, and consequently preferable. Filter this solution in a horizontal tray or dish, and skim well the surface. The plates, having been cleaned as usual, are lowered one by one into the tray, which must contain sufficient liquid to wet only the underside of the plate without being able to pass on the top. They must be raised up and lowered down two or three times at once continuously, and placed upon a grooved drying-stand to dry. That they may do so quickly they should be three inches apart and quite out of danger of dust.

They may be prepared in this manner in advance in large quantities at a time, and kept when dry in plate-boxes, &c.

Of these coated and dried plates the quantity for the day's work may be placed in an oval wooden bucket filled with a solution of alum at two per cent. This solution is filtered before use through a conical felt filter, which will only take about three minutes for sixty pints. I proceed thus:—In the room where the operation of the provisional transfer is performed, the bucket should be placed upon a table or stand nineteen or twenty-four inches high. To the left-hand side of the operator a tap should have been inserted near the bottom of the bucket, and three or four pitchers placed underneath, the filter being suspended above. A quarter of an hour before commencing the transfer the solution of alum contained in the pitchers is poured into the filter, when the bucket will be nearly full. The coated and dried plates are placed vertically therein—one at the side of the other—and inclined against the interior of the bucket in such a way that the second row of plates shall only touch by their top edges those first placed. Fifteen minutes' immersion in the alum is sufficient to render the coating insoluble.

Before proceeding to attach the exposed carbon paper to these insoluble coated plates it is indispensable to wash them for some seconds under a tap of filtered soft water, so as to completely wash away all trace of the alum with which the plates were saturated. This may be done as the plates are required for the transfer.

The impressed carbon paper is attached to the coated plates in the ordinary manner with the squeegee, either in a tray filled with water, or by the application on the plates levelled and covered with as much water as will remain upon them.

When the transferring is terminated the tap is opened, the pictures are filled, the bucket is swilled out with water, and all is ready again for the work of the succeeding day. The development having been properly executed the adherence resists completely hot water, and even boiling water.

After drying the image the second or definite transfer is made, and dried thoroughly, when the proof can be detached most easily by using up a corner without the necessity of making an incision all round the plate. The resulting image is harmonious, sharp in the highest degree, and transparent in the deepest shadows. It is also quite as glossy and brilliant as the enamelled-looking surface obtained with collodion. It may be plunged into water for a long time without losing its brilliancy, although it may lose its glossy aspect. In order to preserve the enamelled appearance it is necessary, before detaching the print from its glass support, to paste with starch upon its back unsized plate paper. Sized paper or cardboard takes a long time to dry, whilst unsized cardboard dries very quickly and remains flat, which is another good quality.

E. Lanny.

THE ART OF PAINTING ON THE PHOTOGRAPHIC IMAGE.

No. XV.

In the third painting of an oil picture after oiling it out where necessary, and removing any objectionable lumps with a sharp knife, the whole thing should be carefully examined as regards expression, colour, tone, light and shade, drawing, and composition, and everything that can be discerned wrong put right. See if the background can be improved by a glaze, as, after the drapery and face are modelled up to their true form, the background often looks too light; or perhaps adjoining the dark side of the face it is too dark, so as to hide some feature that it is desirable to indicate. If this be so, first glaze all over and then "paint into" that part with some thin, warm, semi-transparent tint; but beware of piling on thick paint in the background at this stage of the work.

Then once more look to the hair. If it appear too ropy, boldly paint out those parts too much lined. If it be too hard and metallic looking, soften it here and there and break it up with a line of light or dark. If it look too "fuzzy," put some decided sharp lights here and there, consulting your guide where you may do this with safety.

See, now, if the face will bear another tint all over it; if not, see where it is deficient. Above all things attend to the greys, putting them tenderly in here and there with a mixture of vermilion, terre verte, and white, or ultramarine ash and white in very delicate complexions. You may also heighten the high lights here and there if they will bear it. Glaze the lips with rose madder, and sweetly touch on the little light on the under lip which imparts to it that liquid look so indicative of life. The corners may receive one last glaze of deep warm colour; also the nostrils and the shadow under the eyebrow. Somewhat may also be done by small scumbles here and there of cool colour slightly clouded with white, just on to the edges of dark warm tints, right across those that look too obtrusively red or orange, and one or two delicate "flicks" of vermilion and white about the carnation on the cheek, this part having been previously glazed with a delicate tint of rose madder, if it will bear it.

Some of the reflected lights will perhaps be found to bear warming a little. Much-diluted raw umber is often useful here, but it must depend upon the tint you desire to produce. If it be already too red-looking, for instance, a glaze of terre verte is the best to remedy this; and if too orange, purple or ultramarine ash. If the eyes look dull glaze them, and freshen up the spark of light.

The drapery, if it do not require touching with colour anywhere, may have dried dull here and there; if so, glaze it with medium, and see if a touch or two of thick colour on the lights or transparent on the shadows will improve it. But all through this finish process keep the transparent, glazed passages still transparent; do not muddy them.

I think I have now said all I can about oil painting. It is perhaps the most difficult medium to learn, but the most delightful to practice when once mastered.

Just one caution about brushes. They may be well cleaned with simple soap and warm (not hot) water. Dip the brush in the water, rub it upon a piece of soap until the lather is white, then rinse in water and carefully dry, leaving the brush of a nice, compact chisel shape by a final squeeze between the fingers.

Let the beginner not be discouraged. He is especially liable to this at the beginning of an oil painting; but let him persevere. It may be that at first he cannot get the effect he desires in three paintings. That number is not arbitrary, but is a generally convenient method for those accustomed to work in oils, pictures being often finished in one painting, and still more frequently in two. In the former case little can be done with glazing, but the face must be boldly mapped out as nearly right as possible; and the tints, after being mingled a little, either with a clean hog's-hair tool or a badger sweetener, must be corrected in colour by having other suitable tints painted in to them with thick colour whilst wet. Some very fine effects, and what artists call "quality," are often got in this way.

Joseph Wake.

ON THE EDGE-ANGLE AND DIFFUSION OF LIQUIDS ON SOLID BODIES.

[A communication to the Photographic Society of Great Britain.]

In the course of my researches on the phenomena of capillary attraction at the common surface of the liquids (*Gött. Nach.* 17, 10, 1869), and on the cohesion of saline solution (*Pogg. Ann.* 160, p. 337-374, 560-588, 1877), I was also induced to investigate more closely the relations between liquids and solid bodies. The following results have been obtained:—

The previously-known properties of the common bounding surface of two liquids appear to be possessed also by the common surface of a liquid and a solid body.

The common surface of a solid body (1) and of a liquid (2) has a tendency to become as small as possible, or there exists in it, so to say, a certain surface-tension independent of its geometrical form, and determined only by the nature of the two substances (1) and (2).

The size of an edge-angle* of a solid body (1) and of a liquid (2), which are both bounded by a fluid (3), is only determined by the nature of the three substances, and is independent of the geometrical form of the surface.

The chief principle of the theory of capillary attraction laid down by Thomas Young—that the edge-angle of the free surface of a solid body and of a liquid is a constant quantity—is a particular case of the principle just enunciated when the fluid (3) is atmospheric air.

The edge-angle may be indirectly deduced from the form of flat drops and of bubbles, or may be measured directly by means of reflected light.

The theoretical edge-angle of the free surface of different fluids—as water, alcohol, &c., or as solutions of various salts in water or in alcohol, upon pure glass, crystal, or metal surfaces—appears to be 0°. The fluid is then dispersed or spread out over the clean surface of the solid body. When the edge-angle has, as is commonly the case, a greater value, the surface of the solid is covered with an imperceptibly thin film of some foreign body, and the edge-angle varies with the thickness of this film. This thickness, however, cannot have more than a fixed maximum value, which is as large as, or larger than, the radius of the sphere of action of the molecular forces. The thin film, adhering to the surface of the solid body, may be either a liquid or a gaseous substance. It can also consist of the overlying fluid itself, which may be inferred from the so-called creeping of saline solutions, or from the electrical currents on the surface of the solid body, or occasionally from the interference colour of the light reflected from the fluid.

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* There is no exact equivalent in English for the word which has been translated as "edge-angle." The edge-angle of a drop on the surface of a plate is the angle the free surface of the drop nearest the plate makes with the surface of the plate.—Ed. *Photo. Journal.*

The imperceptibly-thin films of the same fluid have properties varying with the duration and nature of their formation, or according to the description of the solid body to which they adhere. Drops of water quickly formed, for instance, spread out over the surface of clean glass more easily than those slowly formed. These inappreciably-thin films of foreign substances seem to be the cause of the differences between theory and observation in the determination of the surface tension at the common surface of fluids and solid bodies. When the edge-angle is 0°, or, impossible, the fluid extends itself over the surface of the solid body.

With fluids which are capable of mixing under any circumstances, the fluid with the lesser surface tension expels, or pushes aside, the fluid with the greater surface tension. This surface tension and the possible expulsion, or pushing aside, alter, however, with the nature of the solid substance. This completes Brück's theory* of surface diffusion along a rigid wall. The presence of other fluids, and particularly of atmospheric air, considerably modifies the dispersion of a fluid on a rigid wall.

The breath-images of Moser† and Waide‡, obtained by means of steam; *the light-images of Daguerre§ by mercurial vapour;* the electrial breath-images and breath-figures of G. Karsten|| and Riess¶ by the vapour of water, mercury, and iodine, are all explained by the edge-angle of the fluid, which depends on the imperceptibly-thin film on the surface of the solid body.

G. Quincke,
(Corresponding Member.)

Heidelberg, June 30, 1877.

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SUGGESTIONS AS AIDS TO PRACTICE IN THE STUDIO.

[A communication to the Glasgow Photographic Association.]

I really do not know whether or not I should apologise for taking up your time tonight on the following suggestions. I suppose that will depend very much upon their utility or whether they may have sufficient merit to interest the members, or be what the title of this short paper claims for them—*Aids to Practice in the Studio.* These suggestions, if not new, are certainly very practical, and will, I have no doubt, be very helpful to any who may give them a fair and honest trial. I believe most of you are familiar with them, but it is possible that very few may have adopted them in daily practice; and, as it so happens that I am one of the few who have done so, I venture to give you my experience.

The suggestions to be brought before you are three in number, and Mr. A. L. Henderson is the father of two of them. The other was communicated some years ago by Mr. Horton, a ferrotypist in Boston, to the Boston Photographic Society. However, I mention first Mr. Henderson's nitrate of baryta negative bath.

About four years ago I read with much interest his paper on his rapid negative bath, and, having confidence in him as a safe and reliable authority on matters photographic, I at once made up a bath, adhering as closely as possible to the formula and directions given; and as a good thing is said to bear repetition, it will not be much out of place to state the formula here, quoted from The British Journal Photographic Almanac for 1874:—

"Nitrate of silver	2½ ounces.
Common water	30 ,,
Nitrate of barytes	90 grains.
Iodide of potassium	20 ,,
Nitric acid	Enough to show slight acidity.

Filter, and the bath is ready for use." * * "The filtering paper containing the undissolved iodide of silver must not be thrown away, but used every time the bath is filtered." * * "When it requires strengthening add three grains of barytes to each ounce of solution, in addition to the nitrate of silver." This is to make up for loss of baryta in sensitising the plates. My own practice is to judge of the quantity of baryta needed by the appearance of the negative before applying the varnish. So long as a slight veil of the opalescent colour so peculiar to this bath appears in the shadows I consider there is sufficient baryta present; but should this colour disappear, or be so faint as to be barely noticeable, then some more baryta is to be added.

On strengthening the bath I make a solution of sixty grains of silver to the ounce, add some baryta, and leave it in the light, so that the baryta is dissolved and the solution clear when required. Should this bath at any time begin to work slowly or give flat negatives a drop of nitric acid, or filtering with a few grains of iodide of potassium thrown into the filter paper before passing the solution through, generally sets it all right again. When it becomes overcharged with ether and alcohol it is diluted with common water put into an enamelled saucepan, which is then placed over a gas flame. When nearly boiling a few drops of liquor ammonia are added, and the whole boiled down to about one-third of its original bulk. It is filtered when cold, made up to the required strength with water which has had a few grains of silver dissolved in it, and left in the light for a day or two. The bath is then filtered, acidified if necessary, and is ready for work again.

It may be asked—"What special virtues does this bath possess?" The answer is—It is easily and quickly made, does not soon get out of order, is very rapid, and gives nice, clean negatives, with a finer deposit of silver. I am aware that some have not succeeded so well in working by this method; but I think the reason of it will often be found in a departure from the directions given, such as, perhaps, not filtering the solution occasionally through a little iodide in the filter paper, or it may perhaps be due to over-exposure. You will have noticed that, in answer to complaints made to Mr. Henderson, that gentleman has generally advised the above course to be taken. I must say I have few difficulties with the process myself, and have used no other for nearly four years back—that is, for taking negatives—so that it has been tried under every condition likely to arise in the routine of studio work.

But while some have had a few failures it has been worked successfully by others, who have given public testimony to its merits. Besides, the greatest proofs of its merit is to be found in the *work* of Mr. A. L. Henderson himself, by which he has acquired a deservedly honourable position in the ranks of photographers.

As a sequel to the bath, I will now say a few words on the next suggestion, which is connected with Mr. Henderson's new developer. From the quiet way in which this was communicated to The British Journal of Photography, it is, just as Mr. Wilkinson very aptly said of it, one of those things likely to be overlooked. This was the case at least so far as regards myself. It was only when the attention of photographers was called to it in a letter from the last-named gentleman in the number of The British Journal of Photography for June 29th, referring to a communication from Mr. Henderson in that Journal of March 30th, that I noticed it, and took it up. From that time to the present I have had it in constant use, and can only say that, so far as I have gone, it may safely be said to perform all that is claimed for it. I believe my best negatives of the season have been taken by it in conjunction with the baryta bath. The formula is as follows:—

"Protosulphate of iron	2 drachms.
Common alum	4 ,,
Acetic acid	2 ,,
Gum camphor, broken into small pieces	in excess.
Water	6 ounces.

If the negative bath contain more or less than thirty grains of silver to the ounce the alum is to be increased or decreased in the same ratio."

When I commenced to use this developer I kept beside me some of the one previously in use as a standard for compraison, or that I might fall back upon it should any hitch occur with the new bath. I am glad to say, however, that the new friend never failed me in time of need. If under any circumstances a sufficiently-long exposure could not be given I invariably turned to the new instead of the old, and am certainly convinced I could not have got such good results if the old developer and bath had to be depended upon.

All that has been said so far has been in favour of this new aid, but there is one drawback that should be mentioned, and that is a tendency of the alum to recrystallise and fall to the bottom of the bottle, thus destroying the balance or harmony that should exist between the bath and developer. This depositing of the alum has only manifested itself since the commencement of the cold weather, but never during the summer. Of course this defect may be easily overcome.

In making up this developer I would advise the use of ground alum, for the reason that unless it is powdered it will take so long to dissolve that you may vote the whole concern a bore. Mr. Henderson says, in his formula, "gum camphor broken into small pieces." It will be safer, though perhaps not better, to have the pieces *only* small enough to pass through the neck of the bottle; for, if broken very small (seeing that it floats on the top of the solution), it will go with the stream as it flows over your plate, giving a splendid crop of insensitive marks.

Those of the members who may have noticed this formula will have observed that Mr. Henderson claims for it freedom from streaks and stains in the negative. In order to give it a fair chance the glass must be dry. Many photographers give their plates a substratum of albumen. When this is the case they should be dried before using in damp or cold weather, otherwise there will be smears and stains in abundance; and the same will happen if the alum be crystallised in the solution. A case in point occurred with myself today. The silver was almost washed out of the same side of three negatives on which the developer was poured, and yet it was poured regularly in a gentle stream; the stain, however, being on almost the edge of the plates, will do no harm to the prints. The developer was warmed to dissolve crystallised alum, which from frequent crystallisation has destroyed the balance between development and the silver bath, and in this way I account for the stains.

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* *Pogg. Annal.*, 58, p. 82, 1843.

† *Pogg. Annal.*, 58, p. 82, 1843. ‡ *Pogg. Annal.*, 56, p. 177; 57, p. 1, 1842. § *Pogg. Annal.*, 59, p. 255, 1843. || *Comp. Rend.*, IX., p. 257, 1839. ¶ *Pogg. Annal.*, 57, p. 493, 1842. *Riess, Reibungs-Elektricität*, II., p. 224.

Before leaving this subject I may mention that the baryta bath can be used for positives as well as negatives. Sometimes when a negative bath has been boiled down I turn it over to make ferrotypes, and here it displays all those amiable qualities attributed to it in its former vocation.

This last little wrinkle or suggestion is one that may be of use to those who have gone in for those poor, contemptible, sneered-at, nevertheless beautiful, ferrotypes. Of course there are many photographers who do not make this a branch of their business, as in most cases, from the social position of their patrons, it is not necessary they should do so. But even they might adopt the despised ferrotype, in certain cases, with both profit and advantage; as, for instance, when you have a very capricious customer to deal with, similar to the lady of whom it fell to the unfortunate lot of one of our American brethren to take fifteen negatives, besides, I presume, printing and finishing fifteen *cartes*, and did not satisfy her after all. Had he taken *ferrotypes* and obliged her to pay as he went along the case might have been different. This incident may suggest circumstances in which the ferrotype might be utilised. But this apart.

There are many who object to the ferrotype on account of the colour. It is said to be too grey in the whites to be pleasant, and refer to the delicate, pearly whites of the old glass positive. There is much truth in the charge brought against ferrotypes. I think the age of the developer has something to do with the colour of these productions. It will probably be found that a new developer, with a moderate length of exposure, gives better tones. But, after all, is there any reason why the ferrotype should not have a colour of its own, provided it has not too much of the muddy tone, which it need not really have? It is very much within the power of photographers to control the tone of these pictures in such a way as to make them at least pleasant. As to the developer: I have tried a good many, and have settled down for the last two or three years with the following, communicated by Mr. Horton, of Boston:—

Water	2 quarts.
Sulphate of potass	1 ounce.
Protosulphate of iron	1½ ,,
Iron and ammonia	2 ounces.
Liquor ammonia	5 drops.
Acetic acid	4 ounces.

In making up this developer I put the potass and both kinds of iron into a small bag, suspend it just under the surface of the water in a wide-mouthed bottle at night, and its contents are dissolved by morning; the liquor ammonia and acid are then added. If wanted at once sufficient should be filtered for the day's work, the rest being merely left to settle and decanted as required. It is always made up to full strength, and diluted in summer to suit. This developer keeps well, and is very uniform and regular in its working. When the bath is new, or newly boiled, no alcohol is needed. If photographers working ferrotypes try this I am sure they will be pleased with it.

There are many ways in which these plates might be found useful besides making positives. It has been suggested more than once that they might be employed for dry-plate work instead of glass. For this purpose I think they fully commend themselves; and also for taking portraits from which enlargements are to be made. I will conclude my remarks on this subject by appealing to the manufacturers of ferrotype plates to refrain from giving some of them such a dirty, foxey-red colour. I formerly used the brown (which I most prefer), but have had to fall back upon the black (which I do not like so well), because when I ask for brown they generally turn out to be red; but I am not the only one annoyed by this.

In conclusion: I have brought these three matters before your notice, not so much with the expectation of being able to impart anything new, but rather that my communication may give rise to discussion and elicit an interchange of experiences of the daily practice of the members. An exposition of these could not possibly do the slightest harm to anyone, and would not only prove interesting but helpful to all. Should such be the result it will give me the greatest satisfaction, and I shall remain your debtor. THOMAS GILFILLAN.

THE OROHELIOGRAPH.

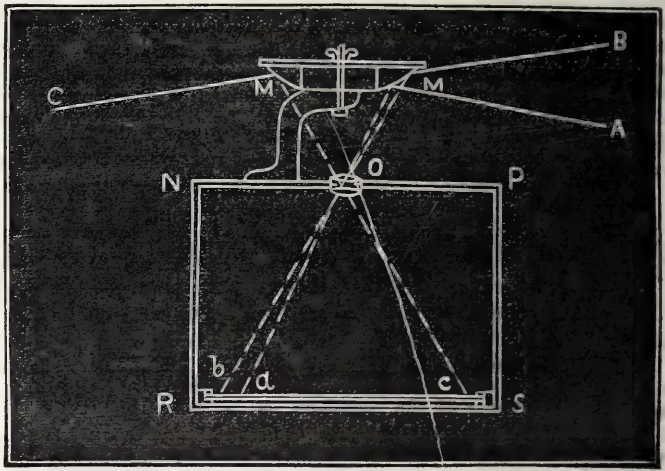
OUR French correspondent writes:—"Thanks to the extreme kindness of M. le Commandant de la Noë, I am enabled to give his communication to the last meeting of the Photographic Society of France in full."

It is as follows:—I have the honour to present a photographic apparatus intended to produce upon one plate and by a single exposure the panorama comprising a nearly complete circle as seen from the position or station necessary from which it is obtained. The only interruption in the image obtained of the whole horizon is that which corresponds to the support of the mirror, which forms the special feature of this instrument; it thus results that if two views be taken, observing that the support occupies a different place in each, a panorama absolutely complete may be secured.

The instrument is composed of an ordinary camera inclined at an angle of 90°, as it was desired to photograph the sky; is surmounted by a parabolic mirror placed at a certain distance above the lens the focus of which is equal to its axis. The purpose of this mirror is to reflect all the luminous rays emanating from the divers points of the horizon and to concentrate them upon the lens, which they traverse, forming upon the sensitive plate underneath the image of the corresponding points.

With this apparatus is obtained, in the form of a circle, a non-distorted image of the horizon. The horizontal lines become naturally curved, but the vertical lines are not deformed; and the angles obtained from the centre of the circle to the different points of the image are exactly equal to those formed by the lines from the station carried out to the corresponding points of the horizon and all visible objects contained thereby. This property makes the apparatus most valuable for reconnaissances, for instance, in mountainous countries; and it can be imagined how by the aid of two or more panoramic views taken from determined places the operator can lay down upon a map the exact positions of different summits and calculate their altitude. In this manner may be obtained with little labour and expense the complete canvas or skeleton of a reconnaissance which may have any of the details completed by ordinary means.

It is for this object, in fact, that the apparatus has been planned, and called by its author "oroheliograph." The problem was drawn up by M. Prudent, captain in the engineers, and realised by Lieut.-Colonel Mangin, of the same corps, who has calculated the form and size of the mirror and studied the various optical conditions which it was necessary to satisfy.



M M, mirror. *b a c*, sensitised plate. O, lens. N P R S, camera.

The model shown to the Society was rather primitive, and was organised to make the first essays. The mirror is not free from imperfections, and there is a sort of astigmatism in the images. The vertical lines are sharper than the horizontal lines. The reflecting surface is badly silvered, and has been injured by want of care in handling; in addition to this the silvering of the exterior is an inconvenience which by another arrangement will disappear, and will permit of obtaining panoramic views without any interruption in their continuity. For all these reasons the print which has been obtained and exhibited does not possess all the perfection desirable, but it largely suffices to show that the final success is assured. The definite and revised apparatus is now in course of construction, and will most probably be made in such a way as to remedy an imperfection which I have not yet drawn your attention to. On the proof before the Society it will be seen that the landscape is in a sense reversed; that is to say, the objects which in nature follow from right to left are produced on the print from left to right. If it were only artistic results it were desirable to obtain, the film could be transferred upon a pellicle and printed from the reversed side, and the inconvenience would then disappear. But for topographical use this manner of proceeding would have bad results in consequence of the varied contractions of the pellicular image, which would render the angles incorrect; this will necessitate a modification, for which purpose there are several plans to choose from.

Such is the presentation I have had to make. You will, I am sure, excuse my having brought before you an apparatus in so primitive a shape; but I thought that the interest of the question would cover the form. I hope, however, to favour you soon by presenting the complete instrument, and in a state of perfection.

Our Editorial Table.

TISSANDIER'S "PHOTOGRAPHY" (Second Edition).

London: SAMPSON LOW, MARSTON, SEARLE, AND RIVINGTON.

THE second edition of this popular work, now being issued, proves exceedingly valuable from the fact that it contains an appendix by the late Mr. Fox Talbot. Certain statements in connection with the early history of photography contained in the text of Tissandier having been found not to convey an accurate idea of the introduction of photography, the publishers were so fortunate as to be able to arrange with Mr. Talbot himself, shortly before his decease, for a detailed account of his photographic labours. While engaged in preparing these details Mr. Talbot was laid low by the hand of death, and a *facsimile* of a letter from him to the publishers, brief as that communication is, will be perused with interest as being probably the last letter on a photographic subject he ever wrote. It bears the date September 12th, 1877, and in it he alludes to the illness from which he was at the time suffering.

Having so recently given a statement of Mr. Talbot's photographic labours we shall not in the present number reopen that subject, but proceed to observe that his son, Mr. C. H. Talbot, has completed the work commenced by his distinguished parent, and in Part III. of Appendix A has given a description of the process of photoglyphic engraving—a process already known to most of our readers. No mention is, however, made of the circumstances which led to Mr. Talbot's devoting himself to the discovery of that process. But we are fortunate enough to be in a position to explain *why* he did so, and the facts connected with which we ascertained in the course of conversation with Mr. Talbot when, thirteen years ago, we published a somewhat detailed account of the deceased *savant's* photographic discoveries, which those interested in the early history of our art-science will find distributed throughout a series of articles in the latter half of our volume for 1864. Having found the silver prints in his *Pencil of Nature* to be rather faded, Mr. Talbot determined to discontinue issuing any more volumes of that work until he had overcome all tendency of the prints to fade. His faith in the stability of silver prints was gone, and he then began to consider what was the most permanent substance in nature. *Carbon* suggested itself to his mind, and henceforward his sole aim was to produce pictures in that substance, especially when presented in the form of printers' ink. This implied an engraved plate, and he set himself the task of obtaining such a plate. In what manner he succeeded is known to all acquainted with the brilliant discovery of photoglyphic engraving. Our space does not at present allow of our entering at greater length upon Mr. Talbot's discoveries; we have merely to express our satisfaction with the record of them in the second edition of M. Tissandier's volume.

The work itself contains a chapter by its editor (Mr. John Thomson), entitled *Pioneers of Photography in England*, and it includes an additional chapter on *Recent Progress in Photography*, presumably by the editor also, inasmuch as it contains some critical remarks on the utterances of M. Tissandier. In this chapter we find allusions to the lichtdruck process of Herren Strumper and Co., of Hamburg, to the "photogravure" process of M. Rousselon, and to Messrs. Leitch and Co.'s process of "photogravure," respecting which processes not a single word of explanation is vouchsafed, doubtless for the excellent reason that they all profess to be *secret* processes, although they are known to more than those connected with the respective establishments named.

The new edition is well illustrated. As a frontispiece we have a capital portrait of Frederick Leighton, R.A., printed by the Woodbury process. There is also a specimen of the lichtdruck process as practised by Strumper and Co., Hamburg; a portrait of J. M. W. Turner, R.A., reproduced by Leitch and Co., from an old steel engraving; together with an Albertype by Mr. A. Pumphrey, and two illustrations of Talbot's photoglyphic engraving, printed from plates engraved by Mr. Talbot himself. We predict that the present will be received with quite as much favour as the former edition. We shall again refer to the work on an early occasion.

Meetings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

In our last number we stated that we should resume our report of the transactions of this Society when we were in a position to present the paper which had been read by Captain Abney. After the reading of the paper in question [see page 603]—

Mr. Herbert B. Berkeley read the following remarks:—

You may, perhaps, remember that I expressed a wish at the commencement of my paper read before this Society last June that my "notes" should introduce the subject of emulsions, and be the means of provoking a discussion upon them. I mention this as I consider that I have already had my "say" in the matter; also because I have very little to add to the remarks then made.

There are, nevertheless, one or two points which have been partly cleared up since the date of writing my paper, and my opinion has been strengthened with regard to others.

I stated that the films I had obtained were coarser than those obtained by Captain Abney by the same method. At that time I had not seen any of Captain Abney's emulsions, and could, therefore, only judge from the results of a correspondence which passed between us on the subject.

During last summer I received from Captain Abney a bottle of his emulsion, which certainly transmitted green, or bluish-green, rays; and I soon found that the bromide was considerably coarser than that which composed my orange emulsions. In my hands, too, it did not prove to be more sensitive than my own emulsions, though it is probable that his form of developer may account for this.

After this experience there appears to me no longer any need to speculate as to the cause of the thinness of image produced by those emulsions prepared by Captain Abney.

As to the cause of the comparative coarseness I am still rather obscure, but hazard the opinion that the albumen in fine division may, under certain circumstances, induce coarseness in forming silver bromide.

I would also state that I have not the slightest doubt that the finest silver bromide transmits the most intense orange rays—I do not say "ruby," as I have doubts whether these rays always indicate extreme fineness.

I am sorry that I am not able to place before this meeting a series of experimental bromised plates produced with nitrate baths of all strengths, and, I may add, all weaknesses.

These experiments have fully justified me in my belief upon three points, viz.:—

1st.—That coarseness of the bromide produces a film which transmits the more refrangible rays to the exclusion of the less refrangible.

2nd.—That coarseness enhances the rapidity of a plate, probably by rendering it more open to the attack of the developer, the development being much more rapid.

3rd.—That coarseness produces thinness of image.

After some observations by Mr. William Bedford, which appeared in our last number,

Mr. T. S. Davis inquired whether Captain Abney recommended the the use of iodide or bromide of potassium; and, on being informed that bromide was used, he said that iodide of potassium had the power of nearly removing an impressed image from a plate.

Captain Abney observed that an iodide of silver plate, with an excess of soluble iodide present, was quite insensitive.

Other remarks followed, but finding that, substantially, they were given in our report of last week, we shall not now refer to them, especially as we shall shortly have original articles on the various subjects discussed.

GLASGOW PHOTOGRAPHIC ASSOCIATION.

A meeting of this Association was held in their Rooms, 172, Buchanan-street, on Wednesday evening, the 12th inst.,—Mr. John Stuart, the President, occupying the chair.

The minutes of previous meetings having been read and adopted, the Secretary reported the progress of inquiries regarding modes of quickening exposure. Mr. Maxwell Graham having been duly admitted a member, and there being no questions, Mr. Gilfillan was called upon to read his paper, entitled *Suggestions as Aids to Practice in the Studio*. [See page 607.] The paper was well received, and Mr. Gilfillan awarded a hearty vote of thanks at the close.

Mr. Stevenson, not having tried either the bath or developer, could say nothing practically about them, but he had noticed writers in The British Journal of Photography enjoining their use. As to Mr. Gilfillan's remark regarding the American photographer who had taken fifteen negatives and sent a corresponding amount of proofs ere he had satisfied his sitter, he had heard but recently from a friend of his, who had lately been in New York, that when he went up to Bogardus's studio, Broadway, and the operation of "taking" was done, he was asked to step down to the show-room, where he was shortly afterwards shown prints from the negatives just taken of him. He did not know whether it was a general custom amongst American photographers, but it certainly showed the great advantage as to light and atmosphere an American artist enjoyed over his unfortunate British brother.

Mr. Urie expressed his satisfaction with Mr. Gilfillan's paper, and considered there were many things advanced in it of great importance. The baryta bath he had used for two or three years, and considered it worked much quicker. Although he had reduced its strength from thirty-three to about ten grains, he had not noticed any appreciable difference in the negatives. Instead of using nitric acid, he thought it better to introduce a few crystals of iodine in the filter-paper, thus liberating the nitric acid in the bath and also rendering iodide of potassium unnecessary. Another great advantage was its non-liability to pinholes. The developer he had also found of considerable advantage. The use of methylated spirits was unnecessary, thus getting rid of the fusel oil sold in its stead and the shellac found in it, as evidenced by the muddy state the developer occasionally got into. He had also noticed, when the bath and developer were not in perfect balance, the impossibility to get negatives of any description. In order to do good work both must be kept equal. As to ferrotypes, he did not think there was sufficient pecuniary profit to be derived from them to induce most photographers to introduce that branch of practice. Provided more remuneration could be secured, he believed they would be found capable of producing results equalling in beauty and purity of whites the old glass positives. Regarding the fifteen proofs and the American's quickness, he thought a better plan would have been to show collodion transfers, which could be produced and shown to the sitter here as quickly as the proof prints were in America, and would look a good deal better than prints from an unmodelled negative.

Mr. Paton (of Gourock), being quite satisfied with the results he got from his old and reliable formulæ, had never attempted the use of the bath and developer spoken so highly of by Mr. Gilfillan; and respecting the showing of proofs to the sitter at the time of posing, he had taken portraits, and in less than half-an-hour shown carbon proofs on opal glass to his clients.

Mr. Sloan had had some little experience of American atmosphere and light. There did not seem to be any very material difference in the time of taking a negative as compared with ourselves, but the printing was done exceedingly quickly—much more rapidly, indeed, than we had any experience of.

Mr. Macpherson said that only that day he had happened to photograph a Canadian gentleman, who, on being told that he could not receive his dozen copies next evening, seemed somewhat astonished, and said it was the custom in Canada to receive them in that time.

The President said that he also had never tried Mr. Henderson's bath and developer, and therefore could not speak about them with authority. The opalescent appearance noticeable in the shadows of Mr. Gilfillan's negatives previous to, but which disappeared after, varnishing he had thought due not so much to the bath as to the collodion used; but when Mr. Urie had a similar experience he saw it could not be attributed to the collodion. As to the commercial aspect of ferrotypes, he thought it would require a very hard day's work to pay even his rent out of them, not to speak of assistants' salaries and other expenses. But he did not look down on them as some were inclined to do; in fact, he thought them a nice style of portraiture, having this great advantage at times—that the sitter could take them away with him at the time of sitting. He believed the baryta bath and developer would give purer whites in ferrotypes than the ordinary solutions. The ordinary bath and developer were the best, however, for colouring purposes, and glass positives in his time were almost all coloured. Regarding Mr. Urie's suggestion as to showing customers collodion transparencies or transfers immediately after sitting, he thought it would be a great advantage to do so, as he had no doubt that all photographers who sent proofs were subject occasionally to "re-sits"—not for any fault in the photographs, but from the dress, or some part of it, not coming out to the mind of the sitter. When he used to do collodion transfers commercially, a great source of annoyance was the getting the transparency film to come off the glass on which it had been squeegeed; but by an accident he found out that by simply damping them on the back of the paper in contact with the film they were removed very easily, failures being the exception. The cold blueness of the tone given by using gold and platinum was the chief drawback to his continuing their production commercially, and he would give a good sum of money to any one who could tell him how a rich, brown, permanent tone could be got, as he did not think in the whole category of photographic processes there was one to equal the collodion transfers. He had experienced what Mr. Sloan had fancied peculiar to America, viz., the great length of time necessary to expose for a negative, while, at the same time, the printing was going on with extreme rapidity. On a cloudless day, when there was nothing but the broad expanse of the blue vault of heaven overhead—such a day as most sitters would feel certain of being taken quickly—he had often found long exposures necessary, while the printing was going on rapidly. A day when there were clouds about, softening and reflecting the sun's rays, proved in his experience the quickest; but at the present time his experience was quite the reverse. Fully-exposed negatives he got just now with ordinary exposures, while from a negative which, in August, gave four prints in one day he found it quite impossible to get one in three days. He felt certain it was from no fault in the chemicals or in the preparation of the paper, as the formula he used was exactly the same as that employed for nearly the last twenty years.

Mr. Urie stated that he found no difficulty in getting prints at the present time. In fact, he could get from one to six prints off one negative per day. His sensitising bath was of forty grains' strength, made alkaline with a few drops of liquid ammonia; but he fumed his paper for fifteen minutes afterwards, and to that he attributed considerable quickness in printing. With fuming, too, better results from a weaker bath could be got than without it.

The President stated that he had tried fuming, but finding it only a trifle quicker did not adopt it permanently. The sensitising bath was a sixty-grain solution with a little washing soda and carbonate of silver to keep it neutral; but he placed great importance on rapid drying, his room being heated up to eighty degrees. His toning bath, which he had not changed for ten years, was simply composed of gold with a little borax as a neutraliser. With it he calculated he could tone from five to seven sheets of paper to one grain of gold. Blisters had been a cause of great annoyance to him. They would appear suddenly, and for weeks and months he would be tormented with them, totally ignorant of how they came and also how they as suddenly disappeared. He found a preventive in passing the prints, after washing, through spirits of wine; and, strange to say, very shortly after he had found this out an American photographic journal advertised the same thing as a preventive.

Mr. Urie thought that blistering was caused by using a too strong bath, the albumen thus becoming hard and horny; but he considered fuming a good preventive for it likewise. The use of alcohol in the sensitising bath also allowed his using a weaker solution without damage to the results.

Mr. Bell asked if prints from fumed paper did not print blue, and give a nasty, blue tone.

Mr. Urie said they did; but by putting them, previous to toning, through a solution of acetic acid or even common salt and water they were changed into a red colour, from which they could be toned to any shade.

Mr. Gilfillan said he had merely read his paper in order to get other members to bring up kindred subjects, as it was by narrating their daily experience and practice the members were most likely to benefit each other—the chief aim of the Association. He had found any kind of developer suitable for the baryta bath. As regarded ferrotypes, he did not yet consider them equal to glass positives. The collodion seemed to him too close to the black backing, an intermediate substance being wanted. He thanked the members for their kindness.

Mr. Paton, of Gourock, showed a case of carbon prints on opal glass *à la* Kareline, which had been exhibited in the recent London exhibition. They were considered by the members to be excellent—the nearest approach to the Russian pictures yet seen; though the President thought they looked a little spotty in effect, and undue prominence was given to the window, in which remarks Mr. Paton also concurred. The latter gentleman was awarded a vote of thanks for showing his pictures.

The next meeting having been intimated,

Mr. George Mason proposed a vote of thanks to the Chairman, which he wished to be all the more hearty seeing that since he (the Chairman) had last been amongst them he had been created Provost of Helensburgh.

Mr. Stuart suitably replied, thanking the members for their congratulations.

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EDINBURGH PHOTOGRAPHIC SOCIETY.

A lantern exhibition, in connection with this Society, was held in Queen-street Hall, on Thursday, the 13th instant.

The slides were kindly lent by Mr. York, to whom this Society has so often been indebted. The subjects were illustrations of a tour in North America, and were all carefully coloured. The rapid succession of mountain, lake, and waterfall, and the wonderful effects of winter on spray and vegetation, with a running commentary by Dr. Nicol, enlivened by some amusing personal experiences, sustained the interest of a very large audience throughout the evening.

◆

LIVERPOOL ASSOCIATED SOIRÉE.

On Friday evening last the lovers of literature, science, and art held high festival at St. George's Hall. No fewer than twenty-one societies associated together to combine for the first time in making an intellectual and attractive display, the like of which has never before taken place in Liverpool. Among the societies represented were the Literary and Philosophical, the Philomathic, Architectural, the Art Club, Naturalists' Field Club, Polytechnic, Microscopical, Geological, Numismatic, Amateur Photographic, Entomological, Historic, Mineralogical, Engineering, the Chemists' Association, Society Armonica, and Vocalists' Union, and some of the kindred societies of Chester and Birkenhead.

The whole of the rooms of the immense building were brought into requisition, and, as each society did its best to illustrate its separate branch, the result could not be otherwise than a great success. Upwards of 2,500 persons were present, the only regret being that amid such a multitude of novel and attractive objects time flew too rapidly to give many of them even a passing glance.

The Mayor of Liverpool opened the proceedings with an address in the Concert-room, stating that it was a most happy conception when the idea occurred to the gentlemen who promoted this union of the learned societies of Liverpool.

The company dispersed to the various rooms to hear the lectures, &c., a concert by the above-mentioned musical societies, a performance by Mr. Best on the grand organ, and to hear the telephone, which was connected with a distant building, and formed a great attraction.

There were four lantern exhibitions of views, statuary, &c., being selections from the best photographic transparencies, shown with excellent effect by Mr. I. Knott. These were supplemented by some capital likenesses of the Mayor and ex-Mayor, and some of the local celebrities, prepared by Messrs. Brown, Barnes, and Bell. As the likenesses were projected on the screen they were greeted with great applause, the originals appearing astonished at being so prominently and unexpectedly brought into notice.

It devolved on the Liverpool Amateur Photographic Association to show the progress and appliances of photography, and in the few hours they had at their disposal they contrived to arrange an attractive collection of photographs in the Grand Jury Room. They themselves confined their exhibits to prints by their favourite collodio-bromide process. Some large prints of Melrose and Furness Abbeys taken direct, and some enlargements from negatives, by Mr. O. R. Green, were among the most prominent. Mr. Johnson had also some enlargements from stereo.-negatives taken by him during the expedition to the land of Moab. Messrs. Henderson, Kirkby, and Palmer likewise exhibited.

A large collection of arctic views, taken by Mr. W. J. A. Grant during the cruise of the *Pandora*, were examined with great interest, the Liverpool members being delighted at the opportunity given them of seeing those excellent results of their pet process when used under such exceptional and difficult circumstances.

Mr. H. P. Robinson's celebrated picture, *When the Day's Work is Done*, was greatly admired, and the beautiful groups of game and flowers, by Mr. and Mrs. Payne, of Aylesbury, were a great attraction to the ladies. Some enlargements of fowls and ducks by the same artists were quite a novelty.

It speaks well for the good feeling existing between the amateurs and their professional townsmen by the latter helping by their contributions to make the display as attractive as possible, and this was evinced by the large and effective display of the different varieties of work capable of being produced in autotype, which were lent by Messrs. Brown, Barnes, and Bell.

Messrs. Robinson and Thompson sent some large frames of landscapes and garden scenes, and also showed several very effective carbon transparencies in the large hall.

The Manchester Photographic Society was also represented by Mr. J. Pollitt, who forwarded a frame of beautiful exterior and interior views of the new Town Hall. These were the more interesting as there was attached record of the exposures and lenses used in taking them.

Mr. W. G. Coote exhibited such charming views from collodio-albumen plates as to win over some of the Liverpool men to give the process a trial.

In the large Hall Mr. T. Clarke showed a valuable microscope, with camera attached, for taking microphotographs, and a camera and condenser for taking transparencies. As these were lighted and fitted to display the subjects on the ground glass, they attracted much attention. A collection of beautiful transparencies were also shown by the aid of the graphoscopes and revolving stereoscopes belonging to Mr. Clarke and Mr. W. Atkins. The scenograph and other cameras were also exhibited.

Some vitrified enamels, consisting of portraits, &c., burnt-in on china vases, plates, &c., and copper medallions, were exhibited, and considerable interest was displayed as to the manner of their production. These were the work of Mr. W. T. Watson, of Hull.

Mr. and Mrs. Payne also exhibited a number of novelties in photographic Christmas cards.

Mr. G. Hare's new revolving albums, one of which had been filled with well-known portraits by Mr. W. Keith, were much admired for their ingenuity and the protection they gave to the pictures they contained.

Considerable amusement was caused by the exhibition, by an enlarging lantern, of two groups of Liverpool town councillors, which had been taken by Mr. J. A. Forrest. The lantern was continually surrounded by their friends anxious to see the pictures projected on the screen. It was in connection with the above group that a story was told at the *soirée* of a "new patent substitute." While making an excursion with several of his fellow town councillors in the lake district, Mr. Forrest, who had his camera with him, was examining a full-face *carte* (on the back of which was pasted the likeness of the back of the head and shoulders) of Alderman B——. Just then a councillor, well known for the interest he takes in all matters connected with literature and art, came up. After looking at the camera, he said that he should be glad if Mr. Forrest would explain his *modus operandi*. "Most willingly," said Mr. Forrest. "I'll take Alderman B——'s likeness if he will be still a moment." After duly posing, the shutter was opened, lens uncapped, and the cap replaced. Mr. Forrest gravely closed the shutter, and, drawing the afore-mentioned *carte* from the back of the slide, handed it to the astonished councillor with the remark that he thought he had got a successful likeness. "Well, I am surprised! What a capital likeness! I had no idea that photography had reached such perfection!" were the ejaculations of the astonished councillor, and it was some time before he saw through the joke. Fortunately for our friend the Town Hall turtle has not yet brought him to the apoplectic proportions considered necessary in an alderman, or his exertions to keep down his risibility might have brought to a sad end the inventor of the latest "patent substitute."

The *soirée* was not concluded till nearly midnight.

AMATEUR PHOTOGRAPHIC ASSOCIATION.

A Council meeting of this Society was held on Monday, the 10th inst., T. Sopwith, Esq., M.A., F.R.S., in the chair.

The minutes of the previous meeting having been read and confirmed, the following members were elected:—J. W. Leigh, Esq.; P. B. Bury, Esq.; G. F. Riddiford, Esq.; M. Coventry, Esq.; and J. D. Radcliffe, Esq.

The Secretary then laid before the Council the prizes, which were approved, as follows:—A large silver goblet for Dr. Cooke, first prize; a silver goblet for R. O. Milne, Esq.; a ditto for W. S. Hobson, Esq.; an oil painting, by Masters, for Major Chadwick; a ditto for Dr. Cooke; a ditto, for T. Brownrigg, Esq.; a ditto, by Frisch, for J. C. Stenning, Esq.; a ditto, by McEvoy, for F. Adderley, Esq.; a ditto for Lieut. Fairtlough; an album, elegantly bound in Russia, for F. Beasley, Esq.; a ditto in Morocco for R. Murray, Esq.; a ditto for W. Vanner, Esq.; and a ditto for R. O. Milne, Esq.

At the conclusion of the proceedings, a vote of thanks to the Chairman having been proposed by James Glaisher, Esq., and seconded by Sir Antonio Brady, was passed by the meeting.

A. J. Melhuish, *Hon. Sec.*

PENNSYLVANIA PHOTOGRAPHIC ASSOCIATION.

A meeting of this Association was held at Mahon and Keller's photographic studio, on Tuesday, November 13th, 1877,—Mr. H. S. Keller, President, in the chair.

The minutes of the last meeting were read and approved.

Mr. Thomas H. McCollin made some extended remarks on the use of Philadelphia washed emulsion, mode of development, exposure, &c., &c., and also showed some exceedingly fine negatives made by that process, which were universally acknowledged by the members present to be equal to the bath process—if not superior—as the subjects were those which would require a longer exposure than would be considered safe for wet plates. The opinion was also expressed that it was believed the day was not far distant when the bath would be entirely superseded by the washed emulsion. Mr. McCollin also showed some very fine copies by the Lambertype process, which were so perfect that the members did not suspect that they were not original negatives until otherwise informed

Mr. J. A. Clemons exhibited a number of old photographs, some made as far back as 1855, which showed no evidence of fading, the whites still being clear; but the cardboards upon which they were mounted had become quite yellow, showing that the prints kept better than the mounts. He also read an article on the cause of fading, written for the *Mosaics*.

On the motion of Mr. McCollin it was resolved that the proceedings of the meetings in future be sent to The British Journal of Photography.

The meeting was then adjourned.

Correspondence.

SPOTS ON EMULSION PLATES.

To the Editors.

Gentlemen,—Among the many suggested causes of transparent spots in emulsion films I have not seen a fact noticed that has appeared prominently in my own limited experience.

I find that a strong developer (strong chiefly in alkali) invariably produces a "midnight sky," while with a weak developer the result is almost invariably perfect freedom from spots. The former effect is specially noticeable in long exposures. I have endeavoured to combine the advantages of weak and strong developers by applying the former first, pouring off on the detail *beginning* to appear, making a large addition at once of ammonia or soda, and increasing the pyro. afterwards if it seemed to be required to strengthen the deposit. By this means I have succeeded to some extent in securing sufficient intensity with short exposures, and at the same time immunity from spots.

Opaque spots of the commoner sort are effectually got rid of by a wash of spirits of wine immediately before applying the edging and emulsion. This also assists in preventing the slipping of the film; but to ensure perfect safety I would caution those who contemplate using a strong alkaline developer (Newton's especially) to give an edging of rubber solution over as well as under the film.—I am, yours, &c.,

Banff, December 5, 1877. W. W. A.

EXCHANGE COLUMN.

Will exchange a violin with carved head (cost 45s.) for a half-plate camera complete and in good order.—Address, D. Hughes, 34, Waugh-street, Askew-road, Gateshead-on-Tyne.

I will exchange several back year-books, *Photo. News*, journals, and instruction books on chemistry, for anything useful, value 25s.—Address, C. H. Wilton, Balby, near Doncaster.

ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

H. G. Box.—Thanks for the newspaper cutting.

F. Gutekunst (Philadelphia).—Thanks for the enclosures. The style is very attractive.

J. J. J.—By "pyro-photography" is meant photographs formed of ceramic pigments and burnt-in upon glass.

F. O. B.—Let the aperture in the window be thirty inches from side to side, the height being in suitable proportion. The accessory should be painted a neutral colour.

W. P.—If you mean an *artificial* light, either magnesium or the electric light must be employed. The latter is the cheaper when the appliances and apparatus have been obtained.

S. S. Crewdson and two other correspondents express a desire that Mr. W. Hellawell would favour them with particulars respecting the developer with which he secures satisfactory portraits with such a brief exposure.

Alex. Henderson.—Your "difficulties" are duly noted. They will be submitted to some experts. In the course of a fortnight we shall try the effect of local heat on films similar to yours and report the result.

R. E. C.—To your first two questions we reply—The British Journal Photographic Almanac for 1878; and in reply to the third query we advise the use of a portrait lens in preference to any other form.

W. Matthews (Bristol).—Before acceding to your request and making use of our columns to "invite the attention of the authorities of police and prisons," as well as of photographic artists, "to your invention," we should like to receive a description of the instrument and apparatus you name the "identiscope."

C. Carruthers.—If you write to the Excise Department, Somerset House, you can obtain the necessary permission. It is illegal to use a still, even for producing distilled water only, without the permission of the Excise. We have not time at present to look through our back volumes for the subject. This you should do yourself.

Argent Nit.—This correspondent, who is a professional photographer, suggests the desirability of dealers supplying him and his brethren with a sensitised paper at half-a-guinea per quire that would keep for about a month. Such a paper, he argues, could be made for nine shillings, and if sold at the price mentioned would yield a profit of eighteenpence to the dealer.

Monochrome.—To obtain greater brilliancy in the prints you must size the paper with some material that will prevent the solutions sinking so deeply into the body of the paper. A weak solution of gelatine will answer this purpose in a very effective manner. The stronger the solution is made the more brilliant, within certain limits, will the print be when finished.

M. B.—Your query will perhaps be answered by the following:—We possess some cloud negatives which were printed upon plain salted paper sensitised by immersion in the silver solution. It was then printed, toned, and fixed, followed by immersion in hydrochloric acid, by which the size was removed. After being washed and dried it was impregnated with Canada balsam dissolved in benzole. To effect this impregnation several coatings are requisite. When dry the texture of the paper will have almost disappeared. By adopting this method you will obtain all that you desire.

Old Photo.—1. German silver behaves differently from silver when being gilt by the electro-metallurgic process. It does not require such a degree of heat, nor does the solution of cyanide of gold require to be so strong. It may even be coated with gold without a battery, provided the solution be strong.—2. If you make a strong solution of cyanide of silver by adding a solution of nitrate of silver to one of cyanide of potassium, the strength of the latter being such as to redissolve the precipitate, such a solution will give a coating of silver to articles of brass or German silver by immersion.

Thulie.—As we have recently said to another correspondent, a *very* weak solution of Castile soap in alcohol forms a lubricator which is employed with much satisfaction by numerous photographers who use burnishers. In reply to the query as to the best varnish for coloured prints, we are unable to give definite information; but, under the heading of "Picture Varnish," Cooley, in his *Encyclopædia*, says:—"Several varnishes, especially mastic varnish, are called by this name. Pale copal or mastic varnish is generally used for oil paintings; and crystal, white hard spirit, or mastic varnish, for water-colour drawings on paper." The crystal varnish here referred to is composed of equal parts of Canada balsam and rectified oil of turpentine.

J. C. H. says:—"Recently requiring a focussing-glass in order to focus very accurately some printed matter which I was copying by photography, and not having one of the regular articles at hand I extemporised one by using the eyepiece of a small telescope, which I found to answer perfectly. The 'dodge' may be useful to some of your readers. The telescope should be unscrewed at the second joint from the eye, the open end of the tube then put square on the ground glass, and the eyepiece pushed in until accurate definition is secured. The picture or the ground glass can then be accurately focussed."——This method will probably be new to some of our readers, but it is one to which we have already, some years ago, directed attention more than once.

J. Ireland (Perth).—Our correspondent sends us an account of an explosion which took place when he was making oxygen. It arose from his making use of an impure sample of oxide of manganese obtained from a neighbouring chemist. Seven ounces of this having been mixed with three-quarters of a pound of chlorate of potash the mixture was placed in the retort, and in about three minutes afterwards the explosion took place. The bottom of the retort was blown out, the glass blown out of the window sashes, and the chimney bent denuded of its soot in a manner so thoroughly as to be extraordinary. Mr. Ireland had a providential escape from death, as he happened to be stooping at the moment of the explosion. As it is he has sustained some slight injuries. The whole neighbourhood was in a state of alarm, and a rumour spread rapidly that one of the engines in the dye-works had burst, the noise attending the explosion being of a terrific nature. We have received a sample of the so-called "oxide of manganese," which we have not yet had an opportunity of examining. It is probable that we shall have a few observations to make on this subject in our next.

T. H. Challis sends the following amusing incident, which will evoke a smile from our readers. He says:—"When out photographing a gentleman's house recently I was asked by an old countryman what I charged for some small *carte* size views of the village that I had sent to the post-office for sale. On informing the old man that sixpence was the price he appeared astonished, and after asking me again, and at the same time naming every part of the village that was visible in the photograph, he said that he had been swindled by a man who, to use his own language, 'only drawed I, and charged I eighteenpence, whereas you draws our church and village for sixpence; you be a much better sort of man, so come and have a drop with I, and give I one of your sketches. Here is the sixpence.'"

Received.—*A Theory of Gravity and of the Solar Process*, by Alfred Dawson, F.R.A.S.; also, *The Delusion of the Day*, by William Carpenter.

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Novel Effects in Lantern Transparencies.—Mr. William England has shown us some new effects, introduced by him with much success in his transparencies of statuary. While the statue itself stands white upon a perfectly black ground, it is surrounded by drapery composed of curtains hanging in graceful folds. These curtains are, in form, similar in all, so as to be suitable for dissolving effects; but in colour they vary, some being green, others crimson or violet. The colour is imparted by a mask of transparent coloured gelatine, and the effect is chaste and pretty.

Books and Photographs for the United States.—As it does not appear to be generally known that the books and photographs forwarded to the United States through the post are liable to customs duty in that country, the Postmaster-General thinks it well to make public the following information on the subject, which has recently been received from the United States post-office:—The only books absolutely books free from customs duty under the United States laws are those which have been printed more than twenty years, and pamphlets, periodicals, and other like publications for the personal use of the individual to whom they are addressed. Nevertheless, any book valued at not more than one dollar is also considered as exempt from customs duty, and so are photographs when sent in limited numbers for the private use of the person to whom they are addressed or for distribution to relatives or friends. If any books or photographs received in the mails from this country are found to be liable to customs duty they will not be delivered to the addresses, but will be returned to this office. The public are therefore warned against posting suchlike articles for transmission to the United States.

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OUR FORTHCOMING ALMANAC.

We respectfully request those of our friends who have promised contributions to forward them to the Editor at the earliest possible moment. To our readers generally we may observe that any articles, hints, formulæ, or notes of practice which they consider calculated to prove of utility to their brethren will be most cordially welcomed by the Editor of the Almanac, if received by Wednesday next.

The Publisher informs us that he can reserve until the time abovementioned a few pages in the advertising sheets for the benefit of those who may have been unable before now to forward their business announcements.

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Improved Vulcanised Rubber Stamps.—No photographer should be without one or more of these stamps for printing his name, &c., on the back of cards, mounts, envelopes, post wrappers, &c., &c. These stamps are very durable, and give a clear and sharp impression equal to printing. Each one is neatly fitted in a mahogany box, with pads and bottle of ink (any colour—red, blue, violet, black, &c.). Prices from 5/-, free by post.—The Rubber Stamp Co., 15, Holborn Viaduct, London, E.C.—Agents for Scotland: G. Mason & Co., Glasgow.—*Advt.*

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METEOROLOGICAL REPORT.

Observations taken at 406 Strand, by J. H. Steward, Optician.

For the Weeks ending December 19, 1877.

These Observations are Taken at 8.30 a.m.

Dec.	Bar.	Wind.	Wet Bulb.	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks
6	29·53	S	45	45	55	41	Cloudy
7	29.91	W	41	43	50	41	Fine
8	30·17	W	38	40	48	37	Cloudy
10	30·00	SW	36	37	41	35	Foggy
11	30·02	NW	35	36	50	34	Foggy
12	29·78	SW	49	50	—	34	Raining
13	29·93	W	37	39	45	37	Cloudy
14	30·20	NW	36	37	43	32	Fine
15	30·55	NW	35	36	47	31	Foggy
17	30·41	W	45	47	49	44	Foggy
18	30·54	N	41	43	46	41	Foggy
19	30·59	NW	34	35	—	30	Foggy

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THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 921. Vol. XXIV.—DECEMBER 28, 1877.

THE PAST YEAR.

In glancing back, as is our custom, upon the occurrences of the year now closing, we have once more to remark upon the paucity of events of importance demanding attention; and we fear that in time to come, when the photographic historian shall review the pages which have been written, he will find little in the records of the year 1877 to single it out from amongst its fellows as one marked by any great strides in the advancement of our art-science. This state of affairs is, as we have remarked upon previous occasions, more the natural result accruing from the advanced stage which photography has reached in late years than to any falling-off in the industry of its devotees; in fact, such rapid advances have been made in some of the years just past that the inevitable reaction has set in, and we are forced, as it were, to pause and devote our whole attention to the study of the new principles which recent research has laid before us.

In this respect we can truly say that the closing year is not behindhand in the amount of careful and painstaking labour its annals exhibit. Rarely, indeed, has such an inclination been shown on all sides to investigate and make plain some of the most difficult and obscure points in the different branches of photo-chemistry; nor has there been any want of attention in the departments more immediately connected with the practice of the art, both in the studio and in the field. The days are now past when even the strongest supporters of photography, if they did not look upon it as a mere mechanical art, at least applied it as such, making manipulatory excellence their chief aim. Now, however, without permitting the technical qualities to suffer, the main object is the improvement of the artistic qualities of the picture. This description of progress grows upon us imperceptibly, and finds its records in the improved class of work produced rather than in our annual summaries.

In the department of chemical and physical research we find the name of Capt. W. de W. Abney, F.R.S., prominent, that gentleman having, during the year, published the results of his investigations of some of the most difficult points in those departments. Almost at the close of last year he communicated to the Photographic Society of Great Britain the interesting fact that if an exposed film be re-coated with emulsion, previous to development, the image formed will be found to be not only in the under film, but also in that which has not been acted upon by light. Later, in an article in the *Philosophical Magazine*, Capt. Abney described some interesting experiments in connection with the action of alkaline pyro. upon silver bromide and sub-bromide, from which he deduces that the quantity of silver reduced in development bears a direct relation to the quantity of alkaline pyro. present, one equivalent of pyrogallic being capable of reducing four equivalents of silver bromide provided sufficient alkali be present to combine with the liberated bromine. At the last meeting of the Photographic Society of Great Britain the same gentleman read a paper treating of the action of certain metallic bromides in eradicating fog in emulsions, and showing that the fog-producing agent—sub-bromide of silver—is converted into bromide, sub-bromide of the new metal being formed simultaneously.

Interspersed throughout our columns during the year will be found numerous articles touching upon the physical properties of sensitive films, and other abstruse theoretical subjects, with which we must identify the name of our indefatigable contributor, Mr. H. B. Berkeley, who has made this line of research his particular pursuit. Though, perhaps, comparatively uninteresting to a large section of our readers these subjects are by no means devoid of importance, leading, as they do, to the thorough elucidation of the difficulties which surround the practice of our art; and, when in course of time the seed sown shall bear fruit, we trust that Mr. Berkeley will receive his due share of the honours.

At the March meeting of the Photographic Society of Great Britain the subject of *pinholes* was introduced by Mr. J. Spiller, F.C.S., and underwent a thorough ventilation, without, however, eliciting much of a novel character. The chief causes were decided to be the presence of excess of iodide of silver and of silver sulphate in the negative bath, the removal of which may be effected by the addition of cyanide of potassium followed by nitrate of baryta, or, as recommended by Mr. Spiller, in one operation by making use of cyanide of barium. Mr. M. Carey Lea has communicated the results of an exhaustive series of experiments in search of a new developing agent; but, beyond establishing the fact that a very large number of substances not hitherto supposed to possess such properties are capable of exerting a developing action, no result of much importance appears to have been as yet attained.

Mr. W. Brooks, in a communication to the South London Photographic Society, made known the important discovery that by treating an exposed film previous to development with certain organic and inorganic substances, or by adding the same to the developing solutions, the resulting image may be considerably modified. Subsequent practice has proved this to be a very useful aid in securing density with films not otherwise capable of rendering it.

While on the subject of density we may notice the method of intensification brought into prominence in this country by Captain Abney and Mr. Warnerke, but emanating from the other side of the Atlantic. This consists in the treatment of the image with a solution of bromide of copper, which, after very thorough washing, is followed by solution of nitrate of silver. The immense accession of strength which this treatment brings about renders the process specially valuable for such purposes as reproductions of line work; but by regulating the strength of the silver solution any less degree of density may be secured, so as to render it suitable for negatives in half-tone. A serious objection to its employment in this latter capacity is, however, found in the fact that the image is almost, if not wholly, soluble in hyposulphite of soda, cyanide, ammonia, and other reagents, unless "fixed" by an additional treatment with alkaline pyro., which gives it a yet greater degree of strength, and entirely unfits it for any but line negatives.

In the printing department we find a steady growth in favour on the part of the carbon process, which has now reached the stage at which the minor or working details assume an importance not belonging to them while the process is in the experimental stage. Early in the year the defect known as "reticulation" was discussed, and found to be due to irregularities in the operation of drying. At the June meeting of the Photographic Society of Great Britain Mr. Sawyer read a valuable and interesting paper on the subject, showing the important effects produced by the so-called "continuating action" of light. During the year Mr. J. R. Johnson, one of the founders of the Autotype Company, has taken out a patent for improvements in the process, the full specification of which we recently published; while Mr. Lambert, of Bath, has also patented an alleged improvement, dispensing with the employment of a temporary support by the attachment of the pigmented gelatine to a stout film of collodion capable of supporting it through the operation of development.

In the studio a new "fillip" has been given to the subject of auxiliary exposures by the introduction of M. Scotellari's method of attaining the desired end, which, however, has produced a great amount of discussion both as to its efficiency and novelty. Under Mr. Vanderweyde's system, portraiture by artificial light has become not only a possibility, but a commercial fact; and the work produced by the Regent-street establishment leaves nothing to be desired as regards quality.

In landscape work emulsion processes appear to be more than ever in favour. Since our last *summary* we have published Mr. P. Mawdsley's directions for working wet emulsion in the field with a degree of rapidity far exceeding ordinary wet plates, and, more recently, other experimentalists have turned their attention in the same direction, It would appear as if the expulsion of the bath from even studio work may yet become a reality.

We omitted to mention in its proper place the introduction by M. L. O. Sammann, of Paris, of a new form of developer for dry plates, having for its basis hydrosulphite of soda in connection with pyro. gallic acid. As we pointed out at the time, this developer exhibits certain peculiar advantages; but as it is rather slow in action, and in point of convenience inferior to alkaline pyro., it will scarcely come into general use. Mr. H. B. Berkeley, however, has adopted it, the whole of his pictures in the late exhibition having been produced by its means.

In the department of processes there is but little to record. M. Chardon, of Paris, was awarded the prize offered jointly by the Minister of Public Instruction and the Photographic Society of France for his method of preparing collodion emulsion, the only novelty in which is the employment of precipitated pyroxyline. The additional expense entailed by this new product will, however, stand against its very general adoption, especially as by variations in the mode of procedure emulsions prepared from an ordinary pyroxyline may be precipitated with perfect success. Captain Abney has made public a very rapid formula for emulsion in which a small proportion of albumen is used. Mr. W. B. Bolton and Mr. F. Wratten have each described a new method of precipitating respectively collodion and gelatine emulsions. The Rev. H. J. Palmer communicated to the Liverpool Amateur Photographic Association a detailed account of comparative experiments with various forms of dry plates, for the results of which we must refer our readers to his paper in the present volume.

A very large amount of information has been contributed as to the cause of spots upon washed emulsion plates by some of the first writers on such subjects, and, if we are not quite in a position to say that spots may now be entirely avoided, we know sufficient of the inducing causes to at least lessen the evil. The most important element in the discussion has been the recognition of the fact that a film produced by merely coating a plate with emulsion and drying it offers a much greater probability of attracting specks and dust (or, rather, of retaining them when attracted) than one which has to undergo the operation of washing previous to drying; hence we know that it is necessary to be more than usually careful to avoid all risk of dust or particles of any sort during the preparation of the plates.

The practice of outdoor photography in the future is likely to be modified in some of its minor aspects; efforts are being made to do away with the bulky and fragile glass support and to substitute a pellicular negative. It is proposed also to remove the uncertainty which attaches to dry-plate exposures by utilising the principle of the actinometer as already applied to the purposes of carbon printing, while the artistic excellence of the results is to be further improved by the adoption of "sky shutters" and movable flaps to equalise the lighting in various portions of the subject.

Some novelties in the way of apparatus have appeared during the year, chiefly in connection with the lime light and the lantern. Messrs. W. J. Chadwick and M. Noton have each brought out new forms of apparatus for the manufacture of oxygen gas, modifications of the principle introduced by the latter gentleman ten years ago. Mr. W. B. Woodbury and Mr. Thomas Fletcher, of Warrington, have been engaged upon the problem of the production of the lime light without oxygen, and at the present time the solution has been effected. Under the name of "Keevil's patent Newtonian lantern" Mr. F. York has introduced a new form of lantern, by means of which "dissolving" effects are produced with a single light. All these appliances, as well as the Rev. Canon Beechey's trinoptric lantern, will be found fully described in our columns.

The last remaining link connecting the present of photography with the past has disappeared from amongst us—Fox Talbot is no more! Taken away in the fulness of years he leaves behind him as a monument our present art-science; for, without disparagement to the independent labours of Niepce and Daguerre, it cannot be denied that the calotype process—the first *negative* process—formed the basis of real, practical photography, and gave it a starting-point from which it has gradually advanced to its present gigantic proportions.

In conclusion: we heartily wish our readers and the photographic community generally—

A Happy and Prosperous New Year!

A TRIPLE-WICK LAMP.

Density is a material factor in the luminosity of flame. This fact was many years since discovered by those who devoted themselves to the improvment of the lighthouse system adopted in this country; for, in forming a complete Argand burner, they placed one circular wick within another, taking care, of course, that each of these concentric wicks should receive an ample supply of air to effect the combustion of the oil. To such an extent has this been carried by those in authority at the Trinity House that, as we are informed by Mr. George H. Slight, lamps having no fewer than six concentric wicks have been constructed in the workshops connected with the Trinity Board. The application to magic lanterns of this system of concentric wicks was long ago suggested, but never before carried into practical effect; for it was found that, although the great dimensions of a flame would be an advantage rather than otherwise in lighthouse illumination, it would be exceedingly objectionable in the magic lantern, in which instrument a small, intense, flame is that which best fulfils those optical conditions demanded by the projection upon the screen of a sharp, brilliant image.

With regard to the density of flame, it is probably not known to some of our readers that such is the transparency of an ordinary gas flame, when a "fish-tail" or "bat-wing" burner is employed in its production, that a piece of printed matter can be read through the flame—that is to say, the printed matter being at one side of the flame and the eye at the other.

It was Mr. Marcy who first realised the fact that in order to secure intensity the flame of the lamp must be straight, or nearly so, and its edge presented towards the condenser. In this way density of the most perfect kind was obtained; but the quantity being deficient, this was made up by the addition of a second straight wick placed parallel to the other. In what manner the sciopticon displaced the time-honoured Argand lamp we do not here pause to indicate; the principle was found to be so superior to its circular predecessor as to have led in a great degree to the discontinuance of the production of the latter.

The excellence of the results secured by the adoption of *two* flames having their edges directed to the condenser naturally led to the query—How, if *three* flames were employed? Mr. J. M. Turnbull, of Edinburgh, about four years ago, set himself to give a practical reply to this question by manufacturing a lamp similar in principle to that of Marcy, but having three wicks. This lamp, if we judge by a specimen sent to us for examination, gave a flame rather small, but very rich in the actinic rays, and, in consequence, well adapted for such photographic work as the production of enlargements. For some reason to us unknown the manufacture of this lamp was not proceeded with. Within the past few months Mr. W. C. Hughes, of Hoxton-street, who is a manufacturer of lanterns, has been devoting his energies in a like direction; and, without any knowledge of what had be done by Mr. Turnbull, has also produced a lamp having three wicks. Mr. Hughes's aim, however, has not been so much to further the ends of the producer of photographic enlargements as to procure the most powerful light possible for the magic lantern, and in this he has been very successful.

The "triplexicon"—the name he gives to the lantern which is lighted by the triple-wick lamp—gives a more luminous disc than any of the other lamps against which we have seen it tried; but this is not to be wondered at when we reflect that in having a third wick it possesses thirty-three per cent. more than the others of the material from which the light is produced. Mr. Hughes has, by paying close attention to the principle by which the combustion is effected, produced a light possessing a high degree of illuminating power, the quality of the light being also excellent.

The wicks of the triplexicon lamp are somewhat wider—from front to back—than those in other lamps of similar principle, being almost two inches. This gives a burning edge of six inches in length, arranged in such a manner as to combine intensity, quality, and quantity. The centre wick is straight; the other two are slightly curved, so as to embrace the centre one between them. The wick tubes, however, are well separated, the flames being all brought into close proximity by the metal cap above the lamp, and through an aperture in which the flame must ascend.

A glass cone, of sugar-loaf proportions, surrounds the flame, this being retained in position by a cone of metal having two large apertures in the sides opposite to each other, one of which allows the light to pass backward, where it is received by a reflector, and the other to be projected forward to the condenser, which is four inches in diameter. To the top of this cone is attached the metal chimney. The oil for which it is constructed is the ordinary paraffine oil, and the heat produced is necessarily great; but in this, as in the case of all other lamps of the sciopticon family, there is such a perfect system of ventilation as prevents the reservoir from becoming heated.

A patent has been obtained for certain special features belonging to this lamp; but of these we shall speak after the specification has been published.

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ADAPTERS FOR CAMERA SLIDES.

It is within the experience of every practical landscape photographer that subjects sometimes present themselves which, from their *contour*, would be better represented if the plate were placed on end than in the usual horizontal way for general landscapes. Of the former are such objects as towers, churches, waterfalls, or ravines. The camera maker usually constructs his instruments so that they may be placed horizontally or vertically to suit the form in which any particular subject or scene must be photographed, and we do not know of any eminent maker whose landscape cameras cannot be so reversed.

At the last meeting of the South London Photographic Society Mr. J. L. Lane exhibited a well-made camera containing certain improvements tending to ensure facility in making the adjustment for a tall or a horizontal picture without the photographer being put to the trouble of undoing a single screw, much less having, as usual, to remove the camera from the stand and rear it on its side. This is effected by means of a species of adapter forming "part and parcel" of the camera, and carrying both ground-glass focussing-screen and dark slide. This adapting-frame is adjusted and fixed in such a manner as to enable the photographer to place his focussing-screen (and dark slides) either in a vertical or a horizontal position, and thus ascertain without a moment's delay, or the disturbance of the camera, which form is the more fitting to adopt. A great saving in bulk, with increased convenience, must result from the adoption of such a system, especially when applied to large cameras.

We have introduced the subject of this improvement for the purpose of inquiring whether the "adapter" system that prevails with our lenses, and with such marked benefit, could not, within a limited extent at least, be also applied to our cameras. We are aware of one gentleman who has a camera for 12 × 12 plates possessing every fitting and adjustment that mechanical science could suggest or London camera makers execute. Our friend would, of course, desire, when he goes out with this camera for a day, to take with him and use in the instrument the sets of dark slides connected with other cameras in his possession, but the dimensions of which are smaller than that to which we have just referred. By means of an appropriate adapter he could thus utilise in one camera the sets of slides belonging to all his other cameras. We are acquainted with others who possessing, it may be, a camera for 7½ by 5 plates, might wish to have the power of using with it the slides of an 8 × 5 or a 7¼ × 4½ camera; and what we suggest at present is the introduction of some species of adapting-frame of light make and proportions that can be taken to the country by the photographic tourist, and which would enable him to utilise when on such tour his whole battery of single or double dark slides, without experiencing the necessity of having to take with him their cameras also. There is more mechanical ingenuity among photographers than would suffice for the solution of the problem we have here propounded, and we invite them to offer such suggestions as will lead to the want indicted being supplied.

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FROST PICTURES.

So far as the time of the year is concerned our title is a seasonable one, but as to the weather poor photographers have had of late we could scarcely pick a less seasonable subject.

We recollect a series of stereoscopic pictures being published a number of years ago giving some marvellous effects of ice and snow, from gorgeous caverns decked with crystal stalactite and snowy stalagmite—deep, diaphanous gorges the abode of elfs and gnomes—the whole collection, in truth, being unique, and as beautiful in execution as poetic in appearance and in the selection of their titles. No clue was given as to the whereabouts of the lovely scenes depicted, and a shrewd opinion was abroad that the whole were artificial constructions put together during the cold season and photographed from a suitable standpoint, stereoscopic photography, as is well known, lending itself to some very curious deceptions.

These pictures we merely incidentally allude to, for we are at one with the Right Hon. R. A. Cross—whose utterances are now so celebrated—in his desire for "truth" in all artistic representation. It is not legitimate to represent vast mountains with snow-topped summits and caverns of unknown immensity by the photographs of a few excellently-contrived models which could be carried under one's arm; but, apart from this, the special pictures it is our object at present to discuss are of a different class.

We write about those most beautiful of all photographic outdoor effects of which we yet see so few pictures—snowy landscapes, with trees covered with hoar frost, their frost-laden branches arresting attention from every passer by from their wonderful coating of crystal feathers. Whether in a photographic representation or in the actual reality there are few sights to be seen which appeal so powerfully to our appreciation of the beautiful and the pure; but nothing is more uncommon in the albums of the collector or in the shop windows of the dealers. Indeed, just as we write, we cannot call to mind ever having seen any such pictures offered for sale, though it can scarcely be doubted that if a few well-executed pictures of the class were produced they would have a great run. Stereoscopic views are almost a drug at present; were it not so we should say that would be a particular direction where the greatest success would lie.

The cause of this scarcity is the difficulty in getting technically-good results combined, perhaps, with a more torpid way of looking at things at a time of the year when, as a rule, the landscape camera is folded and put away for a rest. The beautiful feathery spikes of frozen dew encrusting all nature are seen on only a few occasions duirng a winter. They are as frail as they are beautiful; a breath of wind and they "vanish like the baseless fabric of a vision." It might almost be said that they "leave not a wrack behind," for a minute of time is enough to destroy every vestige of beauty. The photographer who makes up his mind to secure some of these beautiful effects must have everything prepared to start at a moment's notice perhaps for weeks or even a month together, and he cannot wait to learn by chance that "the trees were beautiful this morning." He must have some idea when to expect the phenomena, for such they truly are; and, if he possess a wet and dry bulb thermometer and keep a look out in the sky and on the weather generally, he may, by following the indications we give be pretty certain to be able to predict the occurrence of frost-laden trees when they are likely to be seen.

The necessary requirements are as follow (during a frost, we need not say):—There should be a clear and cloudless sky overnight, a still air, and the presence of an extra amount of moisture in the atmosphere. During a frost there is very little aqueous vapour in the air; hence a heavy fog is very conducive to the deposition of hoar frost when the other atmospheric conditions are suitable. Upon the greater or less complete stillness of the air will depend the magnitude of the ice feathers, whose size and form are the chief element of beauty in these subjects.

But here comes the disturbing element. It not infrequently happens that we get the feather hoar but accompanied by the very fog that begot it, and then, no matter how beautiful, it is no use endeavouring to photograph, as this class of fog is very actinic, and comes out in the negative with greater intensity than it appears to possess in nature. In any case early in the morning is the time to be out to have a proper chance to secure these effects; for it will be found that there is often a lull in the wind in the morning, just after daybreak (and at this time of the year it does not necessitate very early rising to see the day break). A picture may then often be secured before the general public are afoot—secured, perhaps, a moment only before a puff of wind has blown it all away, few people having been aware of its presence. We have often taken friends out to witness this effect of frost, and have always been rewarded by the ecstasies they have gone into, for it seems one of nature's wonders which appeals to every eye. We never met a person who was not specially struck with the peculiar beauty of these frost views.

With regard to the subject chosen: it is desirable not to select too closely-wooded a locality, as the background does not sufficiently throw out the peculiar beauty of the hoar. A single tree, with a suitable foreground, is very effective. We once saw a gnarled oak and a feathery aspen flanking a half-opened old wooden gate, and briars and weeds springing about it, which seemed to us a perfect study. This, without the hoar frost, would have made little impression. There are numbers of spots readily accessible that would form beautiful studies, for less adventitious aid to a few dominent parts of the picture are in such cases necessary. A foreground of an old stile with not too thick a growth of brambles will answer admirably; and this, with one or two trees, would be all that could be required to form a picture, for a set of which, well executed, we predict a brilliant success.

There is one point in connection with our recent article on volumetric test solutions to which we omitted to allude, and which, if neglected, will lead to very serious error. In speaking of the test solutions we directed the salts to be dissolved in a given weight of water; but, if this course be followed in its integrity, the result will be that the volumetric solution will contain in a given bulk a smaller quantity of the test substance than it should according to calculation, owing to the increase in the volume of liquid. We cannot do better than describe our own course of procedure. In order to avoid the trouble of constantly weighing out the quantity of water, and also to guard against the consequent risk of inaccuracy, we obtained from a friend, an analytical chemist, a bottle of such capacity that when it contains one pound avoirdupois, or 7,000 grains of water, the latter reaches a point in the *neck* of the bottle which is carefully marked with a sharp file or writing diamond. Now, in addition to the saving in trouble which this arrangement brings about, it has another and more important advantage—it enables us to dissolve the requisite quantity of the test salt and then to *make up the bulk to exactly* 7,000 *grain measures*, otherwise the bulk would be in excess of that quantity. As an instance of the gravity of the error thus introduced: we were a few days ago testing a sample of bromide of ammonium, which we found to answer to the combining equivalent of 92·98, and on repeating the experiment a similar result was obtained. We were at first at a loss to understand how the obvious error had arisen, as we knew from previous trial that the equivalent of the salt in question was 98, but we eventually traced it to its source. We were trying Gay Lussac's plan of using bichromate of potash to indicate the point at which the silver is in excess, and were employing a solution composed of 100 grains of silver nitrate dissolved in 1000 grains by weight of water, and we found that, owing to the increase in bulk of the solution, it contained in each degree of the burette only about ·95 of a grain instead of one grain of nitrate. The way out of this difficulty is obvious. We may remark incidentally that when operating upon solutions of nitrate of silver of known purity, or when using a silver test solution, bichromate of potash may be employed as the "indicator" in place of blue iodide of starch, which requires some trouble in preparation. The *modus operandi* is very simple; it consists in adding to the solution to be tested three or four drops of a saturated solution of bichromate of potash, which, as long as the slightest excess of silver is present, gives a permanent red colouration of chromate of silver. This disappears when the excess of silver is neutralised, and renders it possible to distinguish to a small fraction of a grain the quantity of silver required.

PRACTICAL DIRECTIONS FOR THE PLUMBAGO PROCESS.

Recently I described a method of improving defective negatives which, for simplicity of manipulation and ease of application, surpasses any other plan I have tried, and for many subjects will prove to be all that can be desired. But many will object to the slowness in printing which the addition of the paper negative entails, and to the care required to prevent its being injured by stains, damp, or tearing; while others, no doubt, will look upon it as "roundabout" and unscientific. To these objections I may add another: with certain subjects it fails to be of use, or its application is surrounded by so many difficulties as to render it inferior to other methods.

The best plan for "doctoring," improving, or reproducing negatives is, without doubt, the "plumbago process," about which so much has been written during the last two or three years, though but little information beyond formulæ and the bare details of the manipulation have been given. As I have used the process a good deal, both experimentally and practically since it was brought into prominence for the purpose by Herr Obernetter, some three years ago, and have met with difficulties in its use, of which I could find no published explanation, I propose to give a few hints which may be useful to others who may be wishful to master the process.

As regards its various applications I shall confine myself to two—the making of duplicate negatives, and the improvement of the originals by the addition of an auxiliary image. The first is, in my opinion, the preferable plan upon all occasions, as it affords greater scope for altering or improving those particular portions which require such treatment more than others, while it leaves the original intact. Thus, if the first result be not satisfactory it may be repeated any number of times, whereas, if the plumbago image be superimposed upon the original collodion film, it is difficult, if not impossible, to remove it without injury to the latter in the event of its not being a success. A reversed negative is, of course, obtained; but if it be required for silver printing the film may be stripped from the glass and either used as a pellicular negative or transferred to another plate, though in such a case I prefer to make a second negative from the first duplicate, in order to avoid the risk of transfer. Though apparently a roundabout way it will be found in practice the quicker, and there need be little fear of any deterioration in the quality of the final picture.

To those who prefer the "improvement" system I should say, most decidedly, do not attempt the operation *upon the film side* of a negative upon which you set any value until you are very certain of your command over the process, and then only after satisfying yourself, by trial, of the hygrometric state of the atmosphere at the time. Even upon the reverse side, if the coating of bichromated glucose be allowed to remain exposed to light until it becomes insoluble it requires such rough treatment to secure its removal as to endanger the safety of the negative.

Of the various combinations recommended for the purpose of forming the sensitive film I prefer a simple mixture of dextrine, glucose, and bichromate of potash, with a variable quantity of glycerine, according to circumstances. This is at once cheap, efficient, and easy of preparation. The formula I employ is as follows:—

Dextrine	1 ounce.
Glucose	1 ,,
Bichromate of potash	400 grains.
Water	20 ounces.
Glycerine	*quant. suff.*

I dissolve the above quantities of dextrine and glucose in one half of the water and the bichromate in the remainder, keeping the solutions separate, and mixing them in equal parts when required for use, though I fancy the mixture improves by keeping it two or three days. The bichromate of potash, in addition to its lower price, forms a film which is less dependent upon added glycerine for its hygroscopic qualities than one prepared with the ammonium salt; hence I prefer it to the latter. The solution of glucose and dextrine when newly prepared has a muddy appearance, which is not removed by filtration; after standing a few days, however, it becomes bright and clear, a partial fermentation or decomposition taking place, with the formation of a considerable quantity of fungoid matter. This decomposition, instead of being injurious, appears to be beneficial; for, besides giving clearness to the solution, it causes it to flow more easily over the plate, and to dry evenly without running away from the edges. The solution I am at present using has been mixed at least three months, contains lumps of slimy matter, and has a strongly-acid reaction, but works well, and when filtered flows over a dry, cold plate like collodion.

The only other material of importance is the plumbago or other powder used for dusting on. Plumbago is, perhaps, the best material that can be employed for the purpose, if it can be obtained in a sufficiently fine powder. In that respect I am badly placed, as I can only get the common powdered blacklead, costing sixpence per pound at the oil shops. This I am obliged to sift through a double thickness of muslin or other fine material, which is a laborious operation. I have not found any means of reducing it to a finer powder by grinding, owing to its "soapy" nature. Upon the fineness of the powder depends the delicacy of the gradations of the negative; for, though the coarser article will adhere to the sticky film, the results are coarse and granular in the half-tints, while the lights are thick and heavy. Hence the importance of securing a suitable powder.

The best substitute I have used is sulphide of silver, or, rather, the impure product obtained by precipitating the silver contained in a spent solution of hypo. used for fixing negatives by means of zinc. I had some of the powder on hand, and it struck me to try it in place of plumbago, and I was delighted to find it produced results little, if at all, inferior. It is easily reduced to powder of extreme fineness when thoroughly dry, and should be strongly heated for some time to expel the free sulphurous acid. The colour of the negative it gives is a warm brown, verging on black in the deeper shades.

In working I use two wide-mouthed two-ounce bottles, into one of which I filter a quantity of the bichromated glucose solution; I coat the plates from this bottle, returning the excess into the filter placed in the second bottle. In this manner I obtain a brilliant coating of the hygroscopic mixture quite free from specks or dust—a matter of the highest importance. In the formula given I have said nothing as to the quantity of glycerine to be used, as this can only be ascertained by trial. It may reach six or eight drops to each ounce, or in very damp weather none at all will be needed; but a single exposure will show whether it is right, and, if not, the correction may be made. With the solution I use there is no difficulty in obtaining a perfectly even coating upon a clean glass; but I prefer to interpose a film of collodion, as it renders the development of the picture more regular and better under control. For this purpose the collodion should be thin, containing three and a-half or four grains of cotton to the ounce, and one drop of glycerine will be found an advantage. Coat the glass with collodion, wash and drain; then pour on the sensitive mixture twice, and dry upon a hot plate, exposing while still warm. Let the negative be also warmed before placing it in contact with the prepared plate.

The exposure should be sufficient to produce a visible image when the plate is laid upon a sheet of white paper. A much shorter time than suffices for this will produce a developed image which, at the commencement of the operation, appears to be all right; but as the operation proceeds the absorption of moisture is too rapid, and the half-tones are lost altogether. It must be borne in mind that an under-exposed plate in this process developes *rapidly*, and *vice versâ*. Very deceptive notions are apt to be formed from the fact that, though under-exposed, a plate may *at first* develope slowly, and after a minute or two suddenly commence to "take" the powder over its whole surface. A properly-timed plate should develope regularly and not too quickly; and, when finished, the deepest shadows should have a polished appearance by reflected light, gradually shaded off to deadness in the high lights. If the film have an uniform, dead appearance it is a sure sign that the exposure has been insufficient.

Before commencing the development the plate should be again warmed until the finger leaves no mark when pressed upon the edge; it is then laid, face upwards, upon a sheet of white paper, and a good brushful of powder passed rapidly over the whole surface. Continue dusting on the powder until the picture, which at first forms very faintly, acquires strength; if the development appear to lag brush off all the powder, and allow the plate to rest for half a minute, or wave it about a few times in the air, but on no account breathe on it. Then again apply the powder, as at first, rapidly over the whole surface. *On no account* should the plate be *held in the hand* during development; the warmth of the hand prevents the absorption of moisture, and leads to patches of uneven action. A flat camel's-hair brush, an inch or an inch and a-half wide, may be used for the general development, and a smaller round one for working up portions which require additional strength. The judgment of the operator and the nature of the subject are the only guides in dodging a defective negative, and with patience a great deal can be done; but I have found that any attempt to stimulate or hasten the development by breathing or blowing on the plate only leads to disaster. On the other hand, however, it is useful to apply heat by means of a spirit lamp, or even by contact with the hand on the back of the plate, to portions which require retarding; but even this must be done cautiously.

When the development is completed brush off every trace of loose powder, and set the plate up with its back exposed to the light for a few minutes, to fix the powder image. It is then coated with collodion (a thicker sample being used than for the preliminary film) and plunged into a dish containing a weak solution of boracic acid, until "greasiness" disappears; rinse it under a gentle stream of water until all traces of bichromate are removed; and then dry and varnish in the usual manner. Should the image dissolve and run between the two collodion films during washing, it is a sign that the sample of collodion is unsuited for the purpose; but this will very rarely occur after the boracic acid treatment. If the film is to be removed from the glass the second coating of collodion must be thicker than is otherwise necessary; and, in case it should refuse to leave the glass of its own accord when left in water, the edges must be loosened with the point of a penknife, when it will soon float off, and may then be carefully removed and placed between blotting-paper to dry.

W. B. Bolton.

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THEORY OF THE DESTRUCTION OF THE PHOTOGRAPHIC IMAGE BY TIME.

I wish to make a few remarks on a subject kindred to that of my last paper which was read before the Photographic Society of Great Britain, and which appeared in your issue of last week. Since its reading I have undertaken further experiments with a view of ascertaining the cause of the fading away, by long keeping after exposure, of the undeveloped image impressed on dry plates. It will be quite evident that none of those agents that I previously used for eliminating fog or destroying the image would cause this gradual fading away. Reasoning from the fact that nitric acid was effective with silver bromide, it struck me that it might be possible to oxidise the loose atom of silver in the sub-bromide ($Ag_2 Br$) and even in the sub-iodide ($Ag_2 I$) of that metal, if the chemical theory of the photographic image held good. Films containing pure silver iodide and pure silver bromide after exposure under proper conditions were washed and treated with potassium bichromate, potassium permanganate, and chromic acid. With the first-named silver compound all were effective in destroying the image. With the last-named silver salt the two last oxidising agents alone were effective, the permanganate requiring a longish application.

Now, if this destruction were caused by an oxidation of the silver atom it should also be oxidised by ozone, since metallic silver when moistened can be oxidised by it. To test this iodide and bromide films were prepared, exposed under the proper conditions, and, after washing, left to the action of ozone, and in every case where proper precautions were taken *the image was entirely destroyed.* Is it too much, then, to assume that the effect of time on an image impressed on a dry plate is to oxidise an atom of each of the molecules forming the image, particularly when it is found that *nascent* hydrogen is capable of restoring it to a certain extent, though its perfection is marred by the reducing action of the hydrogen on the whole film!

I wish also to note one experiment which I made some short time ago, and which struck me forcibly at the time. Two plates were prepared with rather thick emulsion, and exposed to a gas flame behind a negative for equal times. One was immediately developed and gave a good positive, whilst the other was put away in my dark room for a couple of months. On attempting to develope this one the image apparently refused to show at all; but on turning it over, and looking through the glass, an image was seen developing next to its surface. Eventually the image worked its way up to the top surface, and remained as an under-exposed picture. The atmospheric influences had evidently not had time to penetrate so far as the light, which latter must have been much enfeebled when it arrived near the back of the film; and hence, on developing, showed signs of under-exposure.

Is it not probable that the keeping qualities of certain plates, when washed over with gallic acid, may be due to an oxygen absorber being present which the atmosphere must first saturate before it can hope to attack the silver image? Apparently a preservative for a dry plate should be impervious to the air, and for double security it may be presumed it should contain a substance more readily oxidised than the atoms forming the image.

I am keeping some plates in hydrogen and nitrogen which, after a couple of months, will be developed in competition with some exposed to the air in the usual manner. W. DE W. ABNEY, F.R.S.,
Capt. R.E.

THE GELATINE EMULSION PROCESS AND THE PREPARATION OF DRIED PELLICLE.

[A communication to the Manchester Photographic Society.]

IT is my intention to lay before you this evening a brief outline of the gelatine emulsion process, at the same time giving the results of my own experience, hoping thereby to further the successful working of the process, and also that some of our number may be incited to give it a trial.

In giving this outline it would be impossible for me to put forward anything like a satisfactory explanation of the process without repeating a good deal of what has been so often and ably recorded in the photographic journals and almanacs. Therefore I hope I shall not be considered tedious whilst I try to give as clear and concise an account as time will permit.

That the process is one worthy of our attention I am fully convinced, possessing, as it does, special advantages and, it cannot be denied, special drawbacks; but I think it is only fair to expect that as it is more extensively practised and its failures pointed out we may expect better things. To make the emulsion: as to the formulæ there are plenty to choose from; the one I have been in the habit of using was given by "Franklin," in March, 1876, having a slight excess of silver. I find that plates prepared by this emulsion will not keep in good condition beyond three months; if kept longer they lose their creamy tinge, and it is almost impossible to develope without fog. My opinion is that by making an emulsion with bromide in excess very little will be sacrificed, and the keeping of plates and success in development will be more certain. However, I will give the "Franklin" formula, for which any other may be substituted if required.

I will suppose two ounces of emulsion are wanted. Proceed as follows:—Procure an eight- or ten-ounce bottle (I used an orange-coloured one), put in one ounce of water, and add twenty grains of ammonium bromide and forty-four grains of gelatine, and leave it to soak. If the finely-shredded sample be used five minutes will be sufficient; if the thicker sample, such as Nelson's patent opaque, then three or four hours will be required. When soaked immerse the bottle in warm water and the gelatine will readily dissolve. Now dissolve thirty-six grains of silver nitrate in two drachms of distilled water made warm, and add the silver solution to the bromo-gelatine solution in three or four additions, shaking well after each. The emulsion is now formed, and in order to attain its best condition must be kept in this state for five or six hours, after which it is then ready to have the crystallisable salts removed.

The simplest and most efficient method I consider to be washing, when the bottle plan is employed, for which contrivance we are indebted to "Franklin." The emulsion having been prepared in a good-sized bottle, we have simply to revolve it horizontally under a stream of cold water; in five minutes, or less, the emulsion has sufficiently set on the sides of the bottle. Now let a thistle-headed funnel be suspended from the mouth of the tap, and touching, within an inch or two, the bottom of the bottle; a thin stream of water is poured on, passing down the tube to the bottom of the bottle and out at the top, thus, with a minimum of trouble, washing without loss. Providing the bottle is large enough any quantity of emulsion may be so washed. In the hot summer weather I have found it necessary to use iced water. After washing four or five hours the bottle is placed in warm water and the emulsion redissolved; it will probably measure three or four drachms short of two ounces, which may be made up by adding water or an organifier.

Now filter through cotton wool, taking care to warm the filter so as not to chill the emulsion and cause prolonged filtration. When the emulsion is filtered it is ready for use, and if sufficient plates are cleaned none need be wasted; the plates are cleaned on one side only, and no substratum is required. Before coating, brush over with a hog's-hair brush, and hold the plate over hot water to remove chill, the steaming also facilitating the flow of the emulsion.

If sufficient emulsion be poured on the plates, small ones may be coated with perfect ease; a thin glass rod will be useful to guide the emulsion over large plates. Do not drain too much. It is necessary that the plates be placed perfectly level after coating until set, otherwise uneven films will be the result; the best method is that of having a levelled piece of plate glass shielded from falling dust. A coated plate rapidly sets, and may then be transferred to the drying-box. I have brought mine for inspection; it is made from instructions given by Mr. Palmer, with the addition of a chemical thermometer let into the box from the top, by which I can readily ascertain the temperature of heat passing through. The heated air is carried off into the flue of the chimney by means of a tunnel three and a-half inches in diameter, made of stiff brown paper, which arrangement adds to the strength of the current of air passing through the box. The space between the bottom shelf and the bottom of the box is two inches; but I would recommend a space of about six inches, owing to the heat which ascends the cone and comes against the bottom shelf causing it to become very warm and rendering it useless to dry the plates in. I also think a longer box with one or two shelves would be better, as plates placed on the top shelf but one are considerably longer in drying than those below; the top shelf I never use.

With a temperature of 65° to 75° Fahr. a batch of plates take from five to six hours to dry. I have dried a single plate in an hour and a-quarter. I heat the iron cone with a small Bunsen burner; care must be taken to shield it from draughts when burning a low flame, otherwise it may "flop" out and burn at the air-holes, giving off very little heat and a disagreeable smell. The drying being completed the plates are ready for exposure, and if kept they should be protected from damp atmospheres.

I can fully endorse all that has been said in favour of having part beer in the emulsion as a means of conferring density. I use one-fourth, but at the same time I think plates prepared from an emulsion containing beer are more liable to blister than those without it. A dried gelatine film is capable of standing much rough usage.

Sometimes a negative will dry with a dull surface, which is caused by imperfect washing after fixing. This dulness may be removed by holding the part affected under a stream of water and lightly rubbing with cotton wool. I have brought a plate showing this defect, part of which has been removed as described.

The exposure generally required in a good light is about fifteen seconds with a single lens, stop $\frac{f}{24}$. For transparencies about eight seconds are sufficient before a moderate gas flame—distance about six inches. If beer be used in the emulsion a longer exposure is necessary.

To develope I use Kennett's formula, developing in a dish with a white bottom, and allow the plate to soak in water for two minutes previous to applying the developer.

Having gone through the preparation of the emulsion I will now give what I consider to be the advantages and drawbacks of the process. Its advantages are—beauty of result, rapidity, cheapness, and absence of obnoxious fumes. I have brought a few negatives showing density and delicacy, the exposures varying from thirteen to twenty-five seconds, using a single lens stop $\frac{f}{24}$—the emulsion having about one-fourth of beer added, and density being obtained by the alkaline method. The cost of preparing five ounces of emulsion does not exceed one shilling. The operation of coating a batch of plates with a collodion emulsion is, in most cases, attended with rather unpleasant feelings in the throat or eyes—perhaps both; but with gelatine emulsion there are no such effects experienced.

The drawbacks attending the process are—frilling of the film during or after development, the time required for drying plates, and non-keeping properties of the emulsion. The frilling of the film has been, and is still, my greatest difficulty, and is one which has been experienced by most gelatine workers; but I am glad to know there are some who say it is a thing of the past. This proves that it is not a necessary evil, and I hope ere long we may get an unfailing receipt for its removal.

Various causes have been assigned for this defect, such as over-heating either in the preparation of the emulsion or during drying of plates, decomposition of the emulsion, keeping plates in a damp atmosphere, using too much gelatine in the formula, and having an acid and an alkali in the film at the same time. I have brought specimens of frilling; also a film which frilled during washing after development, and by a little care was placed on the piece of glass to which it is now attached.

The film is from a 4¼ × 3¼ plate, and now measures 5¾ × 4½. This will give some idea of the extent to which a film may expand, and also show that it may not necessarily be entirely lost. I have noticed that there are less chances of frilling when very cold water is used in the developing and washing, frilling seldom, if ever, occurring whilst the plate is in the fixing solution. That part of the plate which has taken longest to dry is generally the first part to frill. Epsom salts and methylated alcohol, which have been recommended as cures, are not infallible. I only wish they were.

The time for drying a batch of plates will all depend on the means employed, and as prolonged drying is a certain cause of frilling this part of the process ought to have every attention. A strong current should be made to pass through the box in order to take off the moist air; this may be readily accomplished by fixing a tube from the outlet of the drying-box, and carrying it into the flue of the chimney. Also, the moisture in the heated air may to a great extent be absorbed by allowing it to pass over quicklime or other drying agent, which may be placed on the bottom of the box.

The non-keeping properties of the emulsion are partly counter-balanced by being able to prepare in a few minutes a fresh lot from dried pellicle, a supply of which should be kept in stock.

The Preparation of Dried Pellicle.—Owing to the non-validity of Kennett's patent (it having been declared void) we are now at liberty to make use of what is undoubtedly a very convenient method. During the winter months will be the best time to make a pellicle. Not only have we more time to spare, but the operation of washing and pouring out to set are more easily accomplished, and there are less chances of decomposition than in the summer months. The manner of mixing and the after operations are the same as when making the ordinary emulsion.

To make sufficient pellicle for twenty ounces of emulsion, take a quart bottle, and use the following quantities ("Franklin's"):—

Water	5 ounces.
Ammonium bromide	200 grains.
Gelatine	440 „
Silver nitrate	360 „

The silver to be dissolved in one ounce of distilled water. When the emulsion is made, washed, and redissolved it must be poured out to set on levelled plate glass; the pellicle should not exceed three-sixteenths of an inch in thickness, and is better if one-eighth.

After having poured out the emulsion rinse the bottles out with half-an-ounce of water, made warm; this takes up what is left in the bottle, and must be poured out to set also. The emulsion sets almost immediately. The emulsion having set it is now cut up in pieces about an inch square with a bone or ivory knife, and transferred to frames of network, which are then placed in the drying box (the shelves having been removed). I have a tray of quicklime placed on the bottom of the box. I use two frames of network. The pellicle on the bottom one is dried in six or seven hours with the temperature at 70° to 75° Fahr. I then reverse the frames, and in another six hours the drying is completed. The pellicle must then be weighed; there will be about 770 grains. It may now be kept in a dry place and used as required. If an ounce of emulsion be wanted soak thirty-nine or forty grains of the pellicle in one ounce of water for about twenty minutes; then warm, and it will readily dissolve. When perfectly dissolved filter and coat the plates.

There is another method which I think will be found useful. I have made the emulsion, but cannot speak definitely, not having had time to complete it. My idea is to use only half the quantity of gelatine in preparing the emulsion, and adding the other half of the gelatine (which should be the finely-shredded sample). When dissolving the dried pellicle (if this method be adopted) about twenty-eight grains of the dried pellicle and eleven grains of gelatine will be required per ounce of emulsion. In this way only half the quantity of the gelatine is liable to ill effects in the preparation, and there will consequently be less chance of frilling. I have used the term "warm water," by which I mean water at a temperature of 100° to 110° Fahr. In working this process be careful to use a very non-actinic light.

In conclusion: I hope my remarks on failures will not discourage anyone working the process, but may aid in establishing a reliable gelatine process.

THOMAS CHILTON.

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MECHANICAL AIDS TO CUTTING BINOCULAR PHOTOGRAPHS.

ONE reason why the stereoscope has become to a certain extent unpopular is owing to the carelessness and, in many cases, want of knowledge displayed by the person whose duty it is to cut out the photographic prints prior to mounting. The results of this carelessness are plainly shown when the print is placed in the stereoscope. Among the most prominent defects are either the entire flatness of appearance in the image, or, worse still, the projecting of the picture, in relation to the sides of the mount, which, in a correctly-finished picture, should form a frame or window through which the objects are seen. For this reason it is necessary to mount the two prints at such a distance apart as to allow the mount to be distinctly seen between them, such distance not being less than one-eighth of an inch.

If a person stand in a room and look at external nature through the window, and mark some image that is situated exactly at (say) the left-hand side of the window, and then, still remaining stationary, close the right eye, that part of the image the boundary of which was the side of the window will now be excluded; the same is applicable to the right-hand side of the window and the use of the left eye. When both eyes are employed the landscape is seen to be situated far beyond the window.

This effect is precisely similar to that which is required of a properly-mounted stereoscopic photograph. In order, then, to make the picture fulfil these requirements, great care must be taken to cut the prints correctly. In the first place, from the print is cut, according to the size necessary, one-half of the stereoscopic picture, which is by no means difficult to accomplish. The great difficulty does not lie in cutting the first half, but in cutting the second.

I start, then, with the assumption that the left-hand picture has been cut to the required size. In order to cut the second half two things must be considered:—First, the base line of the first half, which, supposing the camera to have been placed perfectly level at the time of taking the picture, will simply be a continuation of that of the half that has already been cut. This having been ascertained, it is now necessary to cut the remaining sides. Seeing that the prints must be transposed when mounting, it will be requisite to leave a small portion more of the image at the right-hand side of the print now to be cut, and, as both halves must be equal in breadth, there will consequently be less of the image on the left-hand side of the one in question compared with that which was cut previously.

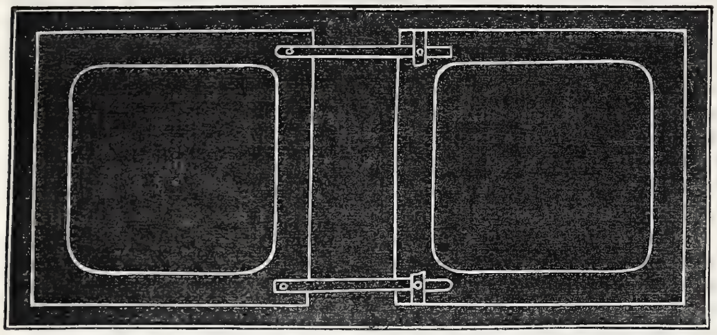
If these prints be transposed and mounted side by side, and subsequently viewed stereoscopically, the desired result is attained, and the image will be seen as if it were projected from behind a frame, through the aperture of which it is seen, this frame being the mount. Hence the desirability of leaving part of the mount exposed to view between the pictures; but in making the desired measurement in order to ascertain the exact degree of inequality in the pictures, the *distance* in the scene must be altogether ignored. It is the foreground that must determine the margin of both pictures. If both halves were trimmed to concede so far as concerns the distance, and the pictures were then mounted and examined, it would be seen that the distance would appear on the same plane as the mount instead of being seen as through an aperture in the mount, while the foreground would present the anomaly of being much nearer to the spectator than the aperture or window through which he is inspecting it. To remedy this, all that is required is that portions from the extreme ends of both pictures shall be removed by the trimming knife until a little less of the foreground of the left-hand picture shall be allowed to remain than that of the right, and *vice versâ*. This secures in the most perfect manner the conditions already laid down, and the whole scene is then represented as at a distance behind an imaginary aperture in the mount.

As this mode of cutting is, however, attended with a considerable amount of guesswork and shifting, which both occupies much time and is very unsatisfactory, scarcely any two pictures from the same negative being exactly similar, I have sought to greatly facilitate this operation by introducing a piece of apparatus for the purpose.

Professor Robinson's trimmer is now beginning to be well known in this country; it is a small rotating wheel fixed in a suitable handle. A plate of metal having any desired form of aperture serves as a mask or guide. This is used as follows:—A sheet of paper is placed on a plate of glass or zinc, and upon this is superimposed the thin metal mask against the edge of the aperture in which the cutter is slightly pressed, and carried round with a moderate degree of force, when the paper will now be found to be cleanly severed as though with a pair of sharp scissors. This operation is rapidly performed with one sweep of the hand.

The apparatus I now recommend for the purpose of cutting stereoscopic prints with mechanical accuracy consists of two masks of the above nature, fastened side by side, and capable of being adjusted so as to stand any distance apart.

The following diagram illustrates its nature. The necessity for having an adjustment of this kind arises from the fact that almost all stereoscopic pictures are at the present day taken upon plates very much larger than suffices for the purpose. Formerly the dimensions of a stereoscopic negative were 6¾ × 3¼, or the size of an ordinary stereoscopic transparency; but at present the size of plate on which the negative is taken is 7¼ × 4½ or 7½ × 5, and as it is obvious that only a small portion of the subject taken upon each half of such a plate can be utilised in the finished stereograph, it becomes a matter of much importance that the portions that are used should be counterparts of each other.



The method of adjusting the compound mask above shown consists in separating the centres of each to a distance corresponding to that which the lenses or the camera are separated, whatever that may be. A more accurate adjustment may be effected by placing the masks on an uncut print, and adjusting the distance apart, according to the principles laid down in the first part of this article. When once adjusted this distance will be found suitable for every negative. It may be laid down upon an uncut print almost at random, so far as its position from side to side is concerned, and the print then cut by two sweeps of the revolving cutter without the possibility of an error in the trimming being committed.

It sometimes happens, though very seldom, that, from carelessness or inattention on the part of the photographer, the camera may not have been properly levelled when a certain negative has been taken. The effect of this is to cause one of the halves of the picture to be higher than the other, the bottoms of each picture being on a different level. Before pictures printed from such a negative can be trimmed, it is requisite that one of the masks be so moved that its base shall not describe a straight line with that of the other, but that it will be higher or lower.

This is rapidly effected by easing the four screws by which the parallel bars are held in a rigid position, and particulars of which are not shown in detail in the diagram, but which will be apparent to every one possessing a modicum of mechanical knowledge. Two sets of adjustments are here necessary—firstly, that which takes cognisance of one part from the other; and, secondly, that which is necessary to bring one to the level of the other. In this case, however, as in the other, when once the masks are adjusted they will be suitable for trimming all the pictures resulting from that negative.

J. H. Taylor.

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NOTES FROM THE NORTH.

Photographers in the metropolis and other large cities who are in the habit of considering their work superior to that of their less-favoured brethren had better look to their laurels if they mean to retain them, as it will take all their time to keep much ahead of some of the men in several of the smaller towns and cities I have recently visited.

Having a few hours to spare while in Dumfries a week or two ago I called on Mr. Rae, who by one consent appears to be *facile princeps* there. I received the usual hearty welcome generally accorded to any one in search of information. He evidently goes about his work *con amore*, and, in return, photography has been a good friend to him, as from what I saw he is evidently what is sometimes not inaptly called a "warm" man. Success, however, seems only to have sharpened his appetite for still greater things, and, not content with what is evidently a good business in Dumfries, he carries on pretty extensive branches in Castle Douglas, Lockerbie, and Ayr. An examination of the work in hand showed that the secret of his success—as it is that also of most men—lies in the high class of pictures produced, and in keeping abreast of the times.

Acting on that principle he became a licensee of M. Lambert, and when I called he was busy with some fine prints by that process. But, while ever anxious to adopt anything that promises a fair return, he does not forget the caution popularly supposed to be characteristic of Scotchmen. When Lambertype was so much talked about he made a journey with a view to arranging for its adoption, and, proceeding to the place where the demonstrations were given, actually passed the door metaphorically jingling the money in his pocket, and returned to Dumfries without investing in a license. Subsequently, when M. Lambert visited Edinburgh, he met him there and was so pleased with what he saw that a license was obtained, and, although he agrees with me in saying that there is nothing patentable in the process, he has had no cause to regret the expenditure.

While I was present Mr. Rae was using the ordinary box photometer supplied by the Autotype Company, and had adopted a neat method of keeping count of the number of tints printed. The photometer was fastened by a pivot to a disc of wood a few inches larger in diameter than itself. This disc was divided so as to form a scale ranging from one up to any convenient number, and to the bottom of the photometer there was attached a metal pointer which, of course, revolved with it. While printing was being carried on the photometer with its pointer was turned one degree as each tint was produced, and thus the record was simply kept without the trouble and delay caused by looking for a missing pencil or the piece of paper that may have been blown away by the wind. Possibly this arrangement may be known, but it was new to me, and I mention it for the benefit of anyone who may be as ignorant as myself.

Complaints are sometimes made that, with regard to fading, pigment prints are no better than they should be, and I have more than once seen specimens in which the once warm colour had given place to a sickly greenish-black; but, thanks to the determination of the tissue makers to do their best, that cause of complaint seems now to be removed. I saw here a staircase window to the panes of which had been transferred a number of large pigment prints of a beautiful purple-brown colour, and although they had been there for nearly two years, exposed to the full blaze of the noonday sun, they were as fresh and brilliant as when first put up.

Here, too, I saw a very pretty "notion" in the shape of a business card, evidently of French origin, although the designs savour more of America than France. On one side, within a neat border, is the name of the photographer and the usual business intimations, and on the other a chromolithograph beautifully drawn, and brilliantly, yet tastefully, printed. The interest, however, lies not so much in the quality of the pictures as in the absurdly-comical—almost ludicrous—nature of the subjects. There are in all twelve varieties, and each in some way connected with photography. In one we have a triple-lens camera, a steam-engine, and upright boiler combined, in full operation, delivering *cartes de visite*, finished and ready for delivery, in a perfect shoal, the public being "taken" as they crush past in thousands. The duties of the operator, who stands pitchfork in hand, are confined to clearing away the ever-accumulating pile of cards from the vicinity of the machine, and to jogging on the crowd when it does not move fast enough.

Probably the finest of the batch—and it really is in composition and execution an excellent picture—is one illustrating the dangers incident to landscape photography. On the left we have the three pyramids, and on the right the well-known group of stunted palms. Near the point of sight the photographer is represented, with his head and part of his body covered by the focussing cloth, in the act of adjusting the camera for a view of the pyramids. In the right foreground is shown, as if advancing with open mouth, a huge crocodile, evidently bent on making short work of the poor photographer.

An ordinary business card has at best but an ephemeral existence, but those in question are likely to be carefully preserved; and as the more a man's name is before the public eye the greater the business he is likely to do, they must form a cheap and efficient means of advertising.

To the admirers of Burns a visit to Dumfries must always be a treat. The house in which he died, the mausoleum where he lies, and the Globe Hotel in which he was wont to spend many an hour, with its relics, including the punch-bowl, writing on the window-panes, and the chair in which he sat, will always be looked upon with much interest. Whether these relics are or are not authentic it is not for me to say; but this I know—that those who are fortunate enough to have Mr. Rae as guide and companion will not fail to enjoy a visit to the town in which he dwells.

In another establishment—that of Mr. R. Wilson—things seemed moving at a quieter pace. He, too, had some good work to show; but I suppose it is not given to everybody to command great success. I found him preparing for the Christmas and New Year seasons by the introduction of a congratulatory card. It has long been matter of surprise that photography has not been more utilised in this direction, but I suppose the exquisite beauty of those in general use, and the low price at which they can be supplied, makes it difficult for photography to compete with printing in colours.

Mr. Wilson combines both processes, his card having in the upper left-hand corner a blank oval measuring an inch in length, with a narrow gold border snrrounded by a floral device, including the "blue bells of Scotland." To the right and under this are printed in red, green, blue, and gold the words—"Wishes you a Merry Christmas" (or "Happy New Year," as the case may be) "and many returns of the same." The oval is intended, of course, to be filled with a small bust of the sender, and to enable the photographer to supply those at a suitable price he should adopt the "penny photograph" system described by me some years ago, as practised by Mr. Robertson, of Dundee. The idea is, on the whole, very good, and if carried out with taste, and the prices kept sufficiently low, this kind of Christmas card ought to become popular.

Stay-at-home photographers are free from many of the troubles to which those whose lives have fallen in tropical countries are subject to. About a year ago a friend from the West Indies, while here on a visit, brought two cameras home to get them converted into rigid-bodied, the bellows of each having been eaten into holes by cockroaches. He was mourning over the inconvenience of a rigid camera in a climate where it is often a trouble to carry oneself, and I advised him to fit the cameras with new bellows and coat them inside and out with a varnish containing *corrosive sublimate* (bichloride of mercury). This was done. He now writes that it has proved a perfect cure, and that having treated his books in the same way not a cover has been injured during the last six months. JOHN NICOL, Ph.D.

ON THINGS IN GENERAL.

IF we could make a list of all the funny things written about photographers and photography by the "leading organs" of taste and culture they would, in course of time, possess a very considerable interest. The frequency with which photography is referred to in daily prints shows its popularity, and the manner in which the weekly dignities by turns praise the votaries of the camera would be instructive in showing how photographers have forced respect from those who once had only words of scorn for them and their work.

Of late there has been quite a little crop of notable paragraphs, a trio of which I shall here register. First comes *Nature*. That really excellent work has given, a week or two ago, a glowing account of "photography in colours," at last stating how it has been achieved by a foreigner, and what results are to be expected from the process. Following upon *Nature's* promulgation of this wonderful news almost every paper in the kingdom has had paragraphs in true *canard* style upon this long-hoped-for discovery, which, I scarcely need say, is another variation of the three-film idea once so elaborately heralded with great flare of trumpets, but ultimately quietly shelved in favour of the most milk-water-like dilution of the original idea.

Then we have the *Daily Telegraph*, not long ago, commenting on Mr. Cross's recent disquisition on truth in art—which, *malgré* the reviewer's strictures, were correct in principle, and well adapted for the audience, albeit, for older and thoughtful minds, rather crude, and a little hackneyed—saying in reference to photography that it is "save when its manifestations are distorted by aberrations in the focus, a thing absolutely and literally true, but without the refining influences of artistic modifications, the works of the photographer would be, as they frequently are, dismally ugly." Now, in reply to this critic, I would say that photography is not by any manner of means "literally true;" but I am afraid that the dismally-ugly type is still woefully frequent.

Finally: I extract from the *Athenæum* a sentence or two couched in more than common dogmatic sapience, though its efforts against its fine-art status are now very feeble and perfunctory:—"The camera is not itself an artist; it may, in a questionable way, be useful in an artist's hands, and thus yield results which possess the charm we find in results of mental operations, artistic as well as others." The sense, logic, and grammar are here about on a par. But I must say we owe to some of our "professors" something of the odium that still clings to photographic art. Thus, when one professing high artistic culture, and who comes to this country to teach art *technique* to photographers, speaks of those who have benefited by his instructions drawing "a nice *profit* * * * in the form of medals from the various exhibitions," a stranger would be justified in believing photography to be allied to commerce rather than art.

With regard to medals: it seemed this year that the exhibitors' breath must have been taken away by the awards at the Photographic Exhibition, for the usual wail by the dissatisfied was rather late in being heard on this occasion. One explanation offered for the non-bestowal of medals in a worthy class deserves preserving for its bold originality; it is that there was such a "plethora of merit"—the pictures being, like Horniman's tea, "always good alike"—that no medal at all was awarded.

I presume that the artistic modification spoken of by the *Telegraph* may not improbably be intended to refer to retouching rather than any special effect of illumination, though I have quite lately read some of the most remarkable and high-sounding pseudo instructions on this subject that would lead the uninitiated to suppose that some of the grandest ideas and principles had been formulated and reduced to cut-and-dried rules and recipes.

Some men write for pelf and some for fame, and the recipients in either case often have their especial reward mixed with much mud. I suppose "An Amateur" who writes in *Mosaics* upon the toning solution may belong to still another class, just as, though all the world is said to be divided into fools and knaves, there is yet another division to be made. I cannot certainly see the likelihood of his obtaining any fame from the publication of his lucubrations, to which I cannot but take a number of exceptions, unless the salts of silver and gold on the other side of the Atlantic vary very much from what we obtain here. Thus: he states that the chloride of gold does not contain eight grains of metal in a fifteen-grain tube. In England it is always stated that the tube contains a certain amount of metallic gold—seven or seven and a-half grains, and never eight. Among all the strange adulterants of this precious metal he actually finds chloride of silver, though how such a salt could get there, and how its presence would not be detected at once by a mere inspection, is one of those puzzles that would defy the keenest intellect. His method for obtaining a pure and economical product savours a little of irony. "Obtain a few books of pure gold leaf," he says; "and whenever you want to strengthen your toning bath dissolve a few leaves by the acid, a few drops each of mixture of hydrochloric acid, apply heat, and evaporate to dryness in a porcelain crucible." This would be paying dear for one's gold with a vengeance! Pure gold leaf (where, by-the-by, is it to be bought?) for chloride of gold! Why not fine gold from the jeweller, or even melt down a half-sovereign, in which there is ten shillings worth of gold (though, I believe, it is illegal to do so, *i.e.*, to destroy a coin of the realm)? I think this amateur should look a little more into these matters before giving such remarkable recommendations as he does.

Another improvement in carbon printing is announced. Instead of adopting the ordinary means to get rid of bubbles in carbon work, a foreign photographer—a certain Herr J. N. Pein—recommends the use of an air-pump. Fancy the subjecting every piece of tissue to exhaustion by an air-pump before developing, when, he says, the bubbles would disappear like magic, and a result be obtained far surpassing anything done before!

I must conclude by expressing a wish that the Editors will be able to give us some more detailed account of the processes mentioned in their report of the Berlin Photographic Society's meeting as having been given by Herr Stender, on various burnt-in and etching processes. I have no doubt in my own mind that so-called enamelling is only in its infancy at present, and every addition to our knowledge is a welcome gain. FREE LANCE.

PHOTOGRAPHY IN COURT.

DISPUTE ABOUT A PORTRAIT.

IN the Kelso small debt Sheriff Court, on Friday, the 21st inst., a case was heard which is interesting to the profession, and which we condense from the *Kelso Chronicle*.

Messrs. Mackintosh and Co., photographers, Bridge-street, Kelso, sued Mr. Charles Robson, of Grovehill, for the sum of £12 12s., being the price of a life-size head, autotype portrait, coloured, of the defender, and a frame for the same. Mr. Stevenson, Jedburgh, appeared as agent for the pursuers, and Mr. Robson appeared on his own behalf.

The defender stated that the late Mr. Mackintosh had frequently spoken to him of having an enlargement of his photograph, and he ultimately agreed to have one of Mrs. Robson and himself on condition that they were perfectly satisfactory to him when they came home. This was some time before Mr. Mackintosh's death; and it was stipulated at the time that the cost of the two portraits should not in any case exceed £9 each, including frame and everything. The order was altogether conditional upon the photograph being satisfactory to the defender. He had had a regular course of dealing with Mr. Mackintosh, and he had accounts which he had paid to him to show the circumstances in which he dealt with him. The agreement was that the sum for each portrait was in no case to exceed £9, with the other condition that he was to be pleased with the photograph when it came home.

The Sheriff said he thought very few people would take an order for a photograph on such a condition.

Mr. Robson said that that was the condition on which Mr. Mackintosh took the order, and he pointed out that the same stipulation was made in regard to an enlarged portrait of his brother. In answer to the Sheriff he said he refused to take delivery of the photograph because it was not satisfactory to him. The colouring was not the same as the cabinet photograph from which the enlargement was made.

The picture having been produced, the Sheriff said that that was a matter of opinion.

Mr. Robson remarked that there was a chalky colour on the forehead and a pink upon the cheeks which were not to be found on the smaller photograph.

The Sheriff said that the colouring was not perhaps so high in the enlargement; but the question was, what was the agreement?

Mrs. Lund stated that she was one of the firm of Mackintosh and Co. She received the order, and the bargain was made with Mrs. Robson and not with Mr. Robson. In the month of October, 1876, Mrs. Robson called at the studio with two cabinet photographs of herself and Mr. Robson, and said they wanted them enlarged to life-size heads. Witness suggested a three-quarter length portrait, but they preferred just the head. The pair was to be within £20. Mrs. Robson said to witness that she wished the frames wider and plainer than those shown her, and a pair of frames were accordingly specially made in London. Witness further stated that the order was not taken conditionally. They would never take an order on the conditions mentioned. The enlargement was executed by the Autotype Company in London, from a cabinet size photograph of the defender, taken at Scarborough. Witness delivered the *carte* in London herself. No company in London would take an order on the conditions mentioned. When the portrait was sent home Mr. Robson said he did not like it, and witness offered to make any improvement or alteration suggested by the defender, but he said he would not have it.

Miss Mackintosh corroborated what the previous witness had said.

Mr. Tunny, photographer, of Edinburgh, was next examined. He said he had been nearly thirty years in business. After examining the picture he said he considered it an excellent one. The colour of the forehead was a little more chalky than the original, but the size had a great deal to do with that effect. The surface being large gave the colour of the picture a lighter appearance. The colouring could be improved. Any alterations or improvements of that nature were made at the suggestion of the person whose portrait was taken. Perhaps, too, there was a little drooping of a part of the mouth, which, however, could be easily altered, as well as the consequent little thickness of the lip. Witness would not accept an order on the condition that the portrait would not be taken if it did not please the person who ordered it. (The Sheriff: It would be very difficult to carry on business on that footing, except in very special cases.) In answer to Mr. Robson, witness said that the enlargement was hardly so highly coloured as the smaller photograph, but that could be easily remedied.

Mr. Robson then gave evidence in support of his defence, repeating what he said at the outset, and adding that following upon his refusal to receive delivery of the picture came an account entered at £12 12s. In the first place he held that the order was conditional upon his approval of the picture, and in the second place that it should not exceed £9 in price.

The Sheriff, after reviewing the evidence, held that the enlargement was an excellent copy of the cabinet photograph taken at Scarborough; that any lightness in the colouring could be easily improved, and that the defender was bound to pay for it. He accordingly gave a decree for £9 and expenses.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

Date of Meeting.	Name of Society.	Place of Meeting.
Jan. 2	Edinburgh	5, St. Andrew-square.
,, 2	Bristol Amateur	Museum, Queen's-road.
,, 2	Photo. Benevolent (Annual)	174, Fleet-street.
,, 3	South London	John-street, Adelphi.

MANCHESTER PHOTOGRAPHIC SOCIETY.

The usual monthly meeting of this Society was held at the Memorial Hall, on Thursday evening, the 13th inst.,—Mr. Alfred Brothers, F.R.A.S., President, occupying the chair.

After the routine business had been disposed of,

The **President** briefly addressed the meeting, chiefly on the subject of the last London exhibition. He referred particularly to the practice of retouching, which, he said, produced pretty pictures, but in most cases anything but a correct representation of the subject. He (the President) afterwards exhibited two negatives illustrating the Scotellari process of supplementary exposure. Both of the negatives were purposely much under-exposed, so as to test the method in an extreme case.

Mr. **Hellawell** said he had seen the very reverse effect produced by the same method, and that, too, in the presence of M. Scotellari himself.

Mr. **Frankland** remarked that Mr. Higginson, of Southport, was more in favour of simultaneously admitting coloured light than of supplementary exposure. He (Mr. Higginson) had two small holes in the camera front, but the colour of the glass in them was not stated.

The new rules were then discussed, amended, and passed.

Mr. T. Chilton read a paper on *The Gelatine Emulsion Process and the Preparation of Dried Pellicle.* [See page 618.] He exhibited several negatives showing sundry defects, and also several good negatives. Mr. Chilton afforded the members an opportunity of seeing his working arrangements.

Mr. Chapman exhibited one of Warnerke's roller slides, and also one of Mr. G. Hare's revolving albums.

Mr. Pollitt showed a small and beautifully-made camera by Mr. Peel. Many members, however, thought there were too many loose appliances about it.

The thanks of the meeting were voted to Mr. Chilton for his interesting paper, and to the other gentlemen who had contributed to the interest of the evening. The meeting was then adjourned.

FRANKFORT-ON-MAINE PHOTOGRAPHIC SOCIETY.

This Society met on the 22nd of October,—the President, Herr van Bosch, occupying the chair.

The minutes of the last meeting having been read and approved, and four new members admitted, the President laid on the table a series of large photographs by Herr Stückrath, of Wiemar, which were intended to illustrate the legend of the *Dornröschen.*

Dr. Stein then showed a large number of microphotographs, taken upon dry plates prepared with Wilde's emulsion collodion, as examples of how dry plates might be used for scientific purposes. He also showed a series of negatives sent to him for that purpose by Herr Wilde. The negatives were all taken in the open air and from the same subject, but the exposures were very different, varying from clear sunshine to rain. A series of whole-plate dry-plate hilly landscapes by Herr Wilde were also shown, which were remarkable for depth and sharpness. The meeting was shortly afterwards adjourned.

The annual general meeting of the same Society was held on the 5th November.

Herr van Bosch commenced the proceedings by calling upon the Secretary to read the annual report, from which it appeared that in the course of the year the number of members had increased from 92 to 118. Herr van Bosch, in fulfilment of a promise, then demonstrated his gelatine process.

When the election of office-bearers took place Herr van Bosch was unanimously re-elected President, but declined to act again on the plea of not being able to spare the necessary time from his business to attend properly to the duties of the office; and, on his motion, Herr Hartmann was elected. Dr. Stein also declined to be re-elected a member of the committee, his practice as a physician having increased so as to make it impossible for him to devote as much time as formerly to the Society's business. Dr. Schleussner was re-appointed Secretary. A banquet closed the proceedings.

RHEINISH-WESTPHALIAN PHOTOGRAPHIC SOCIETY.

A meeting of this Society was held on the 5th October,—Herr Baumann in the chair. Herr Ott (of the firm of Braun and Co., of Dornach), was present by invitation, and showed a number of carbon prints. He made a long speech upon the carbon process, which gave rise to a lively debate, in the course of which

Herr **Creifelds** remarked that he had found the use of reversed gelatine negatives very convenient.

Herr Ott then presented the Society with three large reproductions of paintings in sepia, and eight sheets of Swiss landscapes.

Herr **Creifelds** then returned to M. Scotellari's method, which had been discussed at a previous meeting, and gave the following formulæ, which he believed must be those of M. Scotellari:—

1. *Oxy-Collodion.*

Cotton	18	grammes.
Alcohol	850	c. c.
Ether	1150	,,
Iodide of magnesium	3	grammes.
Iodide of potassium	2	,,
Iodide of cadmium	3	,,
Iodide of ammonium	3	,,
Bromide of cadmium	4	,,
Aniline violet	0·1	gramme.

2. *Silver Bath.*

Water	1000	grammes.
Nitrate of silver	70	,,
Iodine	4	,,

3. *Developer.*

Water	1000	grammes.
Sulphate of iron	50	,,
Sulphate of magnesia	50	,,
Acetate of soda	4	,,
Acetic acid	20	c. c.
Ammonia	10	,,
Alcohol	30	,,

4. *Intensifier.*

Citric acid	5	grammes.
Sulphate of iron	15	,,
Water	500	,,
Nitrate of silver	2	per cent.

The thanks of the members were presented to Herr Ott, after which the meeting was adjourned.

BERLIN PHOTOGRAPHIC SOCIETY.

This Society met on the 19th October last,—Dr. Vogel occupying the chair.

Herr Jacobi showed a few excellent lichtdruck reproductions of chalk and pencil drawings, by Berlin artists, intended to serve as illustrations to a work called *Bausteine*, which is to appear shortly.

The President then read a communication from Herr Busse, the director of the State Printing Establishment at Berlin, giving an account of the process of glass printing as practised in that establishment. The description ran as follows:—"Glass plates, upon which it is intended to take photographic negatives, receive at first a coating of albumen, and when that is dry a coating of collodion. For glass printing fogged negatives are not suited, so that the so-called horny collodion is used, and it is iodised so as to furnish hard pictures. When the negative has been taken in the usual way, a thin solution of bichromated gelatine is poured over it. The plate so prepared is dried in the dark room, and then exposed so that diffused light falls upon it from the back until the drawing appears a dark brown. The soluble parts of the chromic salt are completely washed out with cold water, and the plate rolled with weak lithographic ink. In order to remove the objectionable colour the printing film is etched with a gummy solution to which a little gall has been added. The plate is then ready to be printed from, and is treated like a lithograph."

This process is identical with that of Herr Reising.

Herr Schaarwächter made a report on the late photographic exhibition at Amsterdam, at which he acted as a juror, and he showed a large collection of photographs in which Seavey's backgrounds figured.

Herr Marowsky related that he had lately paid a visit to Herr Harnecker's establishment at Wriezen. Leaving Berlin at a quarter to ten in the morning, taking with him negatives from which he required three enlargements, he was able to return to Berlin that same evening bringing the finished enlargements with him. He observed that the paper on which the enlargements were made was greyish in colour until it was put into a sensitising bath, which made it become white. While still wet from the bath it was stretched on a board, and the enlarged image from the negative thrown upon it. The picture was visible during the exposure, after which it was developed with weak pyrogallic acid, washed, fixed with hypo., and again washed. Care had to be taken not to let the developing solution touch any part of the back of the picture, otherwise it would leave a mark. When necessary the pictures are placed in a gold bath in order to clear the whites. In this way six enlargements were made in two and a-half hours. Herr Marowsky showed the enlargements in question, and they were pronounced exceedingly powerful, having, at the same time, great softness and delicacy in the lights. In Herr Harnecker's establishment he (Herr Marowsky) also observed a very ingenious way of mounting large photographs. The mount was fixed perpendicularly, by small pins, against a door, and the pasted picture was placed against the mount, the upper corners being first placed and fixed.

The President then showed some negatives by Herr Albert, and lichtdruck reproductions of old masters, by Herr Braun, of Dornach.

Herr Fechner showed a couple of life-sized charcoal sketches of Herren Prümm and Stettenheim. These sketches were drawn by free hand by Herr Feilner and his son from small photographs, and were striking and characteristic likenesses.

In reply to a query as to the state of the Society's album,

Herr Marowsky said that as yet he had only received twenty-five portraits of Berlin, and 130 of provincial, members, and begged those who had not yet sent their portraits to do so soon.

The meeting was shortly afterwards adjourned.

Another meeting of this Society was held on the 2nd November,—Dr. Vogel in the chair.

Herr Grimm showed a number of microphotographs, and two chromographs, by Albert and Obernetter respectively, were passed round and examined.

Herr Prümm then related his latest experience with dry plates. He was far from thinking, as some people did, that dry plates could in all cases replace wet ones; still, he considered dry plates perfect treasures for tourists, who only wish to take with them a *souvenir* of the country they pass through, without carrying about all the *impedimenta* required by the wet process. This was the reason why the dry-plate processes were so much cultivated in England, where amateurs abounded. He used to work Fothergill's process, but was obliged to give the preference now to the emulsion process, principally because the latter was more easily and rapidly developed. He had often required to develope for half-an-hour by Fothergill's process, while with the emulsion process three or four minutes were sufficient. The olive-green colour of the Fothergill plates was a great hindrance to the printer watching the progress of the print, while the printing power of an emulsion plate could easily be seen. Latterly he took two dozen of Wilde's emulsion plates with him to Bavaria, and could recommend them. He, however, did not use Wilde's developer, on account of the inconvenience of preparing the gelatine solution when travelling. He had preferred to use Vogel's formula (half a c.c. of pyrogallic acid in alcohol 1:10, eight drops of ammonia, one or two drops of a one-to-four solution of bromide of potassium, and, lastly, eight c. c. of water), and by slightly modifying it got good results. Six of the negatives were as good as if they had been taken with wet plates, six were passable, and the others—owing, however, to circumstances with which the preparation of the plates had nothing to do—were useless. He (Herr Prümm) showed some of the plates in question, and some prints from them, as well as a Fothergill plate.

Herr Liebmann also spoke favourably of Wilde's prepared plates.

In reply to the question whether Herren Reichard and Lindner still after-light their negatives,

Herr Reichard explained that they had only done so experimentally, principally because induced by M. Scotellari. The latter, as was known, had done nothing with his secretly-treated chemicals, while a couple of experiments in after-lighting with violet light had given favourable results. Further experiments with this after-lighting, however, gave no such favourable results. From his experiments his opinion was that after-lighting only gave good results when the light was strong, and, as it was with a weak light that such assistance was most needed, he thought the advantage of after-lighting but small.

Herr Hartmann said he had also made experiments in after-lighting, but had obtained no such favourable results, the whole action resulting in a greater or less degree of veiling of the film. He recommended a coating of matt varnish, or, in the case of flat negatives, the printing through green glass.

Dr. Weissenborn pointed out that at Cologne M. Scotellari's experiments with his chemicals gave unfavourable results, while those with after-lighting were favourable. This result was much the same as that at Berlin; but the Berliners did not look so favourably upon it as his Cologne correspondent.

Herr Richter said a considerable amount of detail might be brought out by intensifying an under-exposed plate with iron, salicylic acid, and silver. He gave the composition of his intensifier as being equal parts of iron developer, weak silver solution, and a saturated solution of salicylic acid in water. The salicylic acid, which is difficult of solution, is added in order to prevent the precipitation of the silver.

The President said he had often obtained a considerable after-development of landscape views by pouring over them a second portion of developer mixed with some so-called intensifying silver. Large portions of the foreground, which appeared very much under-exposed, while the background was rather over-exposed, seemed to spring out. This proceeding had, however, but little effect upon negatives taken in the glass house.

Herr Prümm had often treated under-exposed plates in the same way, and found the veil formed by the spontaneous deposits of silver acted rather advantageously than otherwise. In these circumstances he also added a little pyrogallic acid to the iron.

Herr Halwass held that more details would appear if the plate were washed after developing, and then developed again; also, a more delicate image would be obtained if the developer were allowed to stand upon the plate without being moved about.

Herr Reichard called attention to the peculiar fact that by going over gummed, but not varnished, plates with a rag dipped in graphite further details might be brought out, as they seemed to take on the powder more readily than the other parts.

Herr Hartmann confirmed this statement, and said that he often so treated the under-exposed hair of varnished portraits with pounded-down lead pencil.

To the question whether a developer for portraits should be strong or weak,

Herr Reichard replied that he preferred a weak one. His contained forty grammes of sulphate of copper in 1,500 grammes of water; in winter, or when it was cold, he used it a little stronger.

Dr. Weissenborn had got good results when the light was bad by using Vogel's developer (six grains of iron, three grains of acetic acid, and 160 grains of water), especially when the solution was not quite freshly made.

Herr Schuhmacher secured something like Denier's effects by moving a sheet of glass backwards and forwards in front of the objective during the second half of the exposure.

A discussion followed on Prof. Kühne's experiments with "sehpurpur," and whether birds and reptiles could see whose retina contained no sehpurpur.

Herr Widde asked whether provincial members had a right to use the Society's library, and was answered in the affirmative, provided the books taken out were returned before the succeeding meeting of the Society.

Herr Fechner showed a free-hand-drawn portrait of Herr Schaarwächter.

Herr Schuhmacher showed some pictures.

Dr. Weissenborn then moved that the next meeting—on the 30th November—should conclude with a supper, and on the motion being carried the meeting was adjournd.

EXCHANGE COLUMN.

No charge is made for inserting these announcements; but in no case do we insert any article merely *offered for sale*, that being done at a small cost in our advertising pages. This portion of our columns is devoted to exchanges only. It is imperative that the name of the person proposing the exchange be given (although not necessarily for publication, if a *nom de plume* be thought desirable), otherwise the notice will not appear.

For exchange, a cabinet, containing beautiful miniature plaster casts of the Elgin marbles, by Henning (signed), also the last five vols. of The British Journal of Photography, for half-plate water-tight glass bath, tripod, or studio camera stand, or anything useful in photography. Address, W. Unett, Scarsdale-road, Dronfield, Derbyshire.

ANSWERS TO CORRESPONDENTS.

☞ *Correspondents should never write on both sides of the paper.*

Notice.—Each correspondent is required to enclose his name and address, although not necessarily for publication. Communications may, when thought desirable, appear under a *nom de plume* as hitherto, or, by preference, under three letters of the alphabet. Such signatures as "Constant Reader," "Subscriber," &c., should be avoided. Correspondents not conforming to this rule will therefore understand the reason for the omission of their communications

F. York.—In our next.

Old Reader.—The salt received is chlorate of potash, not nitrate of silver.

Alpha.—First subject the plate to a gentle heat, and then raise the temperature until the collodion film is consumed.

W. A. A.—Do not employ Condy's fluid for rectifying your bath, but use, instead, a solution of pure permanganate of potassium.

F. B. Hartley.—Any of the three makers named may be relied upon. We cannot mention any one as being superior to the others.

Novice.—Apply to Newman, Soho-square, who has published a manual of colouring, in which the desired particulars will be found.

George Bryce.—The photographs have been numbered and returned. Several are so nearly alike, as respects quality, that we had to number them alike, but Nos. 1 and 2 are fine pictures.

C. M. J.—It will answer quite as well if the distilled water be used for the last washing alone, common water being employed for the principal washing.

W. A. P.—The principal fault in the portrait lies in the position occupied by the figure in the picture. The head should be much lower, and be nearly half-an-inch nearer to the right-hand side than it is at present.

Photo (Liverpool).—Place your camera in the position that is to be occupied by the sitter, then with a wide-angle lens take a photograph of the side and roof of your studio, and send us a proof, when we shall be able to advise you.

Bargo.—1. Make use of felt through which to filter the solution.—2. Breathe on the plate, and guide the solution over the surface by means of a thin card.—3. The film may be made stronger by increasing the proportion of dextrine.

T. M'D.—Liver of sulphur is merely an old name for sulphide of potassium. But we advise you to have nothing to do with this substance as a toning agent. There are many better and more reliable methods of toning which have been published.

G. Winter.—Before offering any opinion concerning the rapidity of the plates it is necessary that we be made aware of the focus of the lens and the size of the diaphragm. These are elements of essential importance in estimating the sensitiveness of plates.

Young Experimenter.—At the risk of being considered ill-natured we must decline acceding to your request for detailed instructions with respect to making fulminating silver. This is a substance with which a "Young Experimenter" ought to have nothing to do, unless he desire to have himself blown to atoms.

Belfast.—This correspondent wishes for information with respect to any method by which pot opal may be cleaned after it has been used. He has tried for this purpose nitric acid, sulphuric acid, chloride of lime, cyanide of potassium, soda, and other substances, but these are powerless to remove the markings. Can any reader assist our correspondent?

G. H.—A focussing-screen may, in the absence of ground glass, be extemporised in a variety of ways, among these being the following:—(*a*) Pour upon it a little ground glass varnish prepared by the formulæ to be found in our Almanacs for the past two years; (*b*) form a small cylinder of putty and roll it upon the surface of the glass; or (*c*) apply to the glass a thin paste of flour and water.

D. R. S.—We prefer not giving a reply to your question—"Is it desirable that photographs should be permanent?" There are many persons who, if they saw the photograph we have received—and which we feel assured cannot be your own work—would unhesitatingly reply that it is exceedingly desirable that *some* photographs should not only lack permanency, but fade out of sight as quickly as possible. It is probable there are many photographers who would wish their earlier works were blotted out of existence.

Rev. I. S. B.—The *simplest* way by which to produce a monochromatic flame is to prepare a spirit lamp, having a large wick, and make use of spirits of wine saturated with chloride of sodium, as mall portion of this salt also being allowed to surround the wick. The flame obtained under such circumstances will be monochromatic. We have stated that this is the simplest way, but we do not consider it the best method.

Chromos.—Make a dish of the sheet of paper by turning up the margins and fastening the corners with sealing-wax or varnished pins. Then place the paper upon a flat slab, made slightly warm, and pour upon the centre such a quantity of the solution of gallic acid as will suffice to cover the whole surface when spread by means of a glass rod bent at an angle, or a strip of paper the edge of which is cut straight.

George Lee.—While we are aware of hyposulphite of soda being present in some of the cardboard usually sold, we believe that the dealers in photograpic mounts take every possible precaution to ensure the freedom of their wares from the dangerous antichlor. We must decline your invitation to test the samples enclosed; we have already published several simple and reliable methods by which each one may make such tests himself.

Major Gubbins.—1. The man, not the apparatus, proved a failure. His whereabouts is at present unknown, although there are many who would be glad to receive information concerning him.—2. Try the following proportions:—*Water*, one pint; *gelatine*, one ounce; *bichromate of potash*, two drachms. These are all to be mixed together before being applied to the plate. The sensitiveness is not sufficiently great for enlarging upon direct, unless a solar camera be employed.

Inquisitor.—What we meant was this—bromide of silver being soluble in ammonia, and iodide of silver being insoluble in this liquid, a glass coated with collodion and afterwards sensitised and washed may have its film analysed, to some extent, by ammonia. The following is an instructive experiment in connection with the point raised in your letter:—Coat and sensitise a plate as before, wash, and expose to light. Now apply an alkaline developer to reduce the bromide of silver and treat with nitric acid, by which all the reduced metallic silver will be removed, leaving the iodide unaffected.

☞ **Editorial Communications should be addressed to "THE EDITORS"—Advertisements and Business Letters to "THE PUBLISHER"—at the Offices, 2. York Street, Covent Garden, London, W.C.**

South London Photographic Society.—The first meeting of this Society for the next session will be held on Thursday next, January 3rd, 1878, at the House of the Society of Arts, Adelphi, when the annual lantern exhibition will take place, for the purpose of showing transparencies by members and friends.

Photographers' Benevolent Association.—The annual general meeting of this Association will be held at 160A, Aldersgate-street, on Wednesday next, 2nd January, at eight o'clock. We hope as many of our readers as can attend will do so, and give their countenance to a society worthy of much encouragement.

LONDON GAZETTE, *Tuesday, December* 18, 1877.

Partnership Dissolved.

Charles and Silk, Birmingham, photographers.

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METEOROLOGICAL REPORT.

Observations taken at 406 Strand, by J. H. Steward, Optician.

For the Week ending December 26, 1877.

These Observations are Taken at 8.30 a.m.

Dec.	Bar.	Wind.	Wet Bulb	Dry Bulb.	Max. Tem.	Min. Tem.	Remarks
20	30·69	NW	41	44	45	33	Cloudy
21	30·53	W	42	44	47	40	Cloudy
22	30·37	W	45	46	52	42	Cloudy
24	29·82	W	40	43	48	35	Cloudy
25	29·79	NW	33	35	40	30	Fine
26	29.35	NW	32	34	41	30	Fine

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